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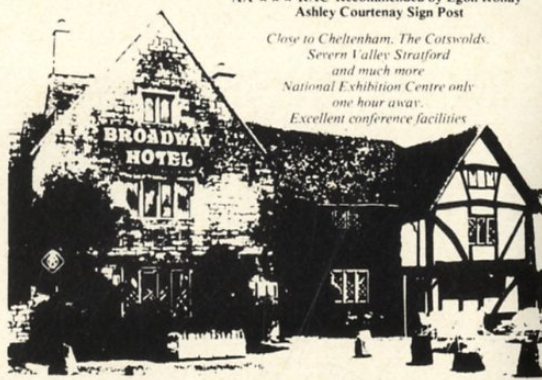
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aircraft ILLUSTRATED

October 1981 Vol 14 No 10

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Cover: RAF Vulcan B2, XM606 of No 1 Group RAF Strike Command, over East Anglia and in a starboard bank — a view that displays the aircraft's unmistakable planform to advantage. The type has now been in RAF service for 25 years (see caption and photograph, this page) and is operated in the strike/attack and maritime radar reconnaissance (MRR) roles. The latter mission is fulfilled by the Vulcan B2(MRR)s of No 27 Squadron based at RAF Scampton and is the subject of the article on pp444-449.

Photo: Crown Copyright, MoD

Frontispiece: Airbus A300B4, EC-DLF, of Spanish carrier Iberia, at Orly airport on 30 May 1981. 'Lima Foxtrot' was the airline's second Airbus (see 'Airliner Orders & Deliveries' table, Jun 81, p240) and was delivered on 23 March 1981. Iberia A300s were the first to be powered by Pratt & Whitney engines.

Photo: Denis Fleury

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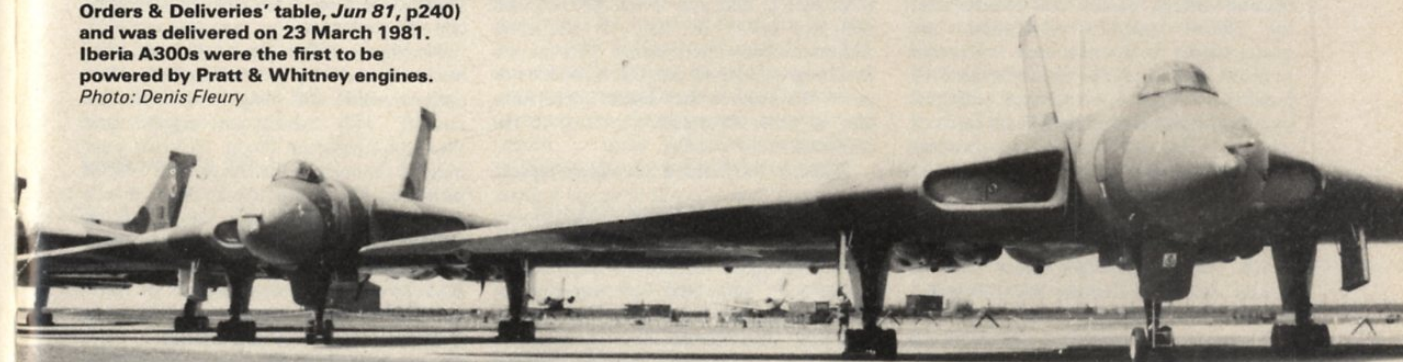
This picture: A view of some of the aircraft featured in the celebrations held at RAF Scampton on 25 July to commemorate the 25th anniversary of the entry into RAF service of the Vulcan. Representative aircraft from each of the seven squadrons still operating the Vulcan were arranged in a special line-up and an additional four aircraft gave a flying display. Photo: BAe Manchester



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Paul Humphreys

The numbers game

There's two sides to every story. The fundamental truth of this simple statement was borne in upon your man when undertaking a little light bedtime reading recently.

The title on the front cover of this riveting paperback was 'Overseas Trade Statistics (OTS) for the United Kingdom' published by the HMSO for the Department of Trade. It contains more figures than you'll encounter on a whole holiday's march across the beaches at Cannes, San Tropez and Margate. They are all to do with the results of our overseas trade — not just exports but imports too — during 1980.

Naturally the Humphreys eye flew to the pages reserved for the aerospace industry's performance during that troublesome year. What did we sell overseas? The analysis in the OTS was described as 'selective' so it included only aircraft, engines and parts thereof, plus tyres, parachutes and ground flying trainers. What an odd selection of products. No avionics, no flying clothing, no missile systems? The Industry nevertheless did the UK proud during 1980 with exports reaching an all-time record value of £2.9 billion. This was an increase of some £500 million over last year's total. Well done lads!

There is, however, a growing body of opinion among commercial experts that the official statistics on exports are questionable. It is not easy to obtain accurate figures on the money earned by hundreds of small companies who sell overseas. It is even more difficult to work out the value of their indirect exports. Without excessive effort how is it possible, for example, to assess the value of exports of the nuts, screws, washers and bolts manufacturer who supplies the company which makes passenger seats sold to British Aerospace for the BAe146 which will be sold overseas?

There is no standard international system for the collection, recording and reporting of statistics concerning aerospace exports. Even within the EEC the member countries' statistics on their markets are far from common. The major difficulty is with definition and classification. Then there is the second-hand business and the deals in which so many middle-men make paper transactions. It happens, you know.

The same paperback also produces figures showing the value of aerospace equipment imported into the UK during

1980. This came to nearly £2.3 billion. But wait a minute... some of the kit — which came in from a surprising total of 67 named countries — will probably be exported again sometime. It could involve aircraft or engines back for overhaul or foreign airlines' aeroplanes which have been repaired after going u/s at a UK airport. Confused? So is everyone else who sets out to interpret the figures.

Okay, okay. The £900 million worth of aircraft, engines and parts from the USA is understandable. New Boeing 737s and 747s, the Cessna, Piper and Beech types, engines from Lycoming, Continental, General Electric and Pratt and Whitney. None of this comes cheap. Equally understandable are £209 million imports from France and £245million from W. Germany. But what aircraft did we import from Togo that cost us £6 million and from Mauritania for which we shelled out nearly £1½ million? And your man would dearly love to know what were the piston engines and parts which the UK apparently imported from Spain, Singapore, Malaysia, Dubai, Sudan, Costa Rica and Gabon at a total cost of £¾ million?

Still confused? Join the club. All this merely underlines the complexity and the almost uselessness of statistics of this kind. The only comment to be made is to repeat the old saying 'if all statisticians were laid end-to-end it would be a very good thing'!

Sounding off

Way back at the beginning of this year's air display season your man — on behalf of a mate — made a mildly impassioned plea to pilots and owners of aircraft scheduled to appear in displays. It was to the effect that not always do they let the commentators know in advance their names and biographical details, the aerobatics or other manoeuvres they intend to perform and all other information relating to the aeroplanes they will fly.

Whether this caused any display pilots to put pen to paper will never be known, but there do seem to be more informative commentaries this season. At Sywell, Staverton, Biggin Hill, Prestwick, Cheltenham Race Course and Tollerton the chat was relaxed and full of detail of interest both to your Total Aviation Persons (TAPs) and those who were only there for a day out. The Greenham Common extravaganza was something else in every respect. The inclusion of appropriate music plus the commentary team's informed repartee gave the eight-hour display that touch of something which the other displays lack. Who will easily forget the sight and sound of the BAe Nimrod displaying to the emotive chords of Elgar's 'Nimrod'. Of the 250,000 people who attended the event, there can be few who did not realise that they were taking part in

a new concept of commentating when they heard chat by the pilot of the F27 displaying in front of them. Keep it up chaps.

Safety wheeze?

A short article in a flight safety magazine published in New Zealand — without wishing to enter the exalted realms of the aero-medics, the gist of the piece bears repeating here, particularly for General Aviation pilots.

Carbon Monoxide — CO — does not only leak out of faulty engine exhaust systems, mufflers or cabin heaters. It makes up about 3% of cigarette smoke and up to 8% of cigar smoke. A 20-a-day cigarette smoker is walking about at ground level with between 4 and 8% of his blood saturated with CO. Now, down among the daisies he's probably A-OK; put him up at altitude and he's in trouble. Tests have proved that CO in tobacco smoke can lower a pilot's altitude-tolerance by as much as 6,000ft so that, from a medical standpoint, smokers are already 'at altitude' before they get off the ground. Add to this a reduced eye sensitivity, night vision cut by about 20% and nicotine-induced body heat production 10 to 15% above normal creating increased oxygen demands, and one can see why pilots and smokers should be two different groups of people.

If you fly and can't eschew the weed, then be prepared to go over to oxygen earlier than a non-smoker and to use it always during night flying at any altitude.

Royal Flight

Along with 750 million other television viewers around the world, I was glued to the box for the Royal Wedding. What a spectacular achievement by everyone who took part.

No other nation in the world could have mounted such an operation. Sadly, few nations would still cling to such mature aircraft with which to equip their Monarch's personal Flight. Not that your man is knocking the Avro 748 — or whatever it's called these days. It's a splendid aeroplane, and it's British. It would have been nice, however, to see the Royal couple wing off to 'Gib' aboard a BAe125 or a BAe One-Eleven.

Exhibition — Stop Press

An exhibition of aviation paintings by Michael Turner is being held at the Battle of Britain Museum, Hendon, London between 4 September and 3 October 1981 to mark the publication of a book of the artist's work entitled 'Royal Air Force — the aircraft in service from 1918'. Over 80 of Michael Turner's paintings, many of which are well known from the History of the Royal Air Force picture cards series, will be displayed at the exhibition, the majority of these originals being offered for sale.

Boeing 767 roll-out

The new Boeing 767 twin turbofan airliner was rolled-out at the company's Seattle, Wa plant on 4 August 1981. Approximately 15,000 people attended the unveiling of the 767, the aircraft being finished in a striking red, white and blue colour scheme and appropriately registered N767BA. Following the ceremony, the new airliner — a Boeing-owned test aircraft — was moved to the pre-flight line nearby. N767BA is equipped with 30,000lb of test equipment and was scheduled to make its maiden flight in September. On the final assembly line the second and third 767s are near completion; both will be for United Airlines and they are powered by Pratt & Whitney JT9D-7R4 engines. These examples will also be involved in the flight-test programme (along with a third United 767), leading to initial certification in July 1982, after which the United aircraft will be refurbished and delivered to the airline for commercial service in late-1982. A fifth 767, destined for Delta Airlines, will be used to certify the airliner with General Electric CF6-80A engines.

The Boeing 767 — the first all-new Boeing airliner since the 747 — was launched in July 1978 when United Airlines placed an order for 30 aircraft. The design features a new long-span wing and an innovative flight instrumentation and management system based on digital electronics for enhanced fuel-conservation and engine control. Boeing estimates that these benefits will confer fuel savings up to '35% per seat over earlier jetliners that the 767s will replace'. The wide-body, medium-range 767 has a twin-aisle interior and will accommodate 210-290 passengers (depending on layout).

Lockheed's TR-1

The first of 35 Lockheed TR-1 tactical reconnaissance aircraft for the USAF was rolled-out at Palmdale, Ca on 15 July. The TR-1, a variant of Lockheed's U-2R being flown by the Strategic Air Command, is powered by a single Pratt & Whitney J75-P-13B turbojet engine and can cruise at 430mph at over 70,000ft. The aircraft has a range of more than 3,000 miles and from its high operational altitude it will be able to record information at distances several hundred miles either side of its flightpath. Lockheed engineers have designed the TR-1 to be equipped with interchangeable noses, mission bay hatches, and instrument wing pods so it may carry nearly two tons of sensors and experiments.

● In June 1981, NASA's Ames Research Center received an ER-2 earth resources



Above: The new Boeing 767 airliner, N767BA, during roll-out ceremonies at Boeing's Everett plant near Seattle, Wa on 4 August 1981 (see 'airnews' item). Photo: Boeing

aircraft from the same assembly line producing the TR-1 fleet. This was the result of a joint USAF/NASA effort.

'Super Tomcat' flies

Powered by two General Electric F101 DFE engines, the F-14 'Super Tomcat' took-off on its maiden flight from Grumman Aerospace Corporation's Calverton, NY facility on 14 July. The sortie initiated a 24-flight test programme to evaluate the F101 DFE engine as a potential alternative powerplant for US Navy F-14 aircraft; the type is currently powered by Pratt & Whitney TF30-P-412A turbofans.

● The first flight of the F-14 'Super Tomcat' followed the completion of the USAF F-16/101 flight test programme in May 1981.

BAA makes profit...

Despite a fall in air traffic of 1.5%, the British Airports Authority (BAA) has announced pre-tax operating profits of £36.3 million in its 1980/81 Annual Report and Accounts. The report also stated that BAA's programme for increasing capacity at Southeast airports — Terminal 4 at Heathrow and, subject to planning permission, Terminal 2 at Gatwick — together with developments at Aberdeen, require a capital expenditure programme of £766 million over the next five years.

... but BA announces £141 million loss

A worldwide recession, a strong pound, increased competition and a stagnant market, all contributed towards the pre-tax loss of £141 million announced by British Airways for the financial year that ended on 31 March 1981; this result contrasted with a pre-tax profit of £20 million in the previous year. The report reveals that both passenger and cargo services were seriously affected by the recession — passenger numbers fell by nearly 1½ million. The chairman of the airline, Sir John King, says that British Airways must look to the Government for the encouragement that is due to the principal national carrier, and the creation of an industry environment in which it can prosper. The current

streamlining of routes and staff numbers is to continue in an effort to reduce costs.

Harrier accident report

An RAF Harrier GR3 flying from RAF Gutersloh, West Germany crashed into a wood 1km south of Kalenborn on 28 October 1980. The Ministry of Defence has released a summary report of the accident as follows:

Circumstances: Harrier XV761 was flying as No 2 of a pair of Harriers at low level. On rolling out of a turn the pilot, flying at some 900ft AGL, found that he had lagged slightly behind his leader. He increased power to retain the correct formation position but there was a loud bang and the engine ran down. Although he had not seen any birds prior to the engine malfunction, the pilot suspected that the engine had sustained a bird strike so he correctly shut it down and attempted a relight. Although the engine relit normally, it surged as the pilot attempted to increase power and he therefore shut it down again. A second relight attempt produced the same result. By now the aircraft was down to about 300-400ft AGL and the pilot ejected. He received slight injuries. The aircraft crashed into a wood and was destroyed.

Cause: Strip examination of the engine revealed extensive pre-crash damage to the high pressure compressor. This had been caused by the passage through the engine of an extraneous piece of metal. Where the object had struck compressor blades, fatigue cracks had propagated from the impact marks and one blade had broken off. The engine was damaged to the extent that it was unable to produce sufficient power for XV761 to remain airborne. It proved impossible to identify either the piece of metal which caused the original damage or to calculate when it was ingested into the

engine. No evidence of a bird strike was found either in the aircraft wreckage or during strip examination of the engine; therefore, an engine surge caused by a bird strike was considered highly unlikely although it could not be ruled out.

Subsequent actions: The only civilian property damaged was the wooded area into which the aircraft crashed. Claims amounting to £650 for damage have been received.

Posthumous George Medal for SAR crewman

An RAF search and rescue helicopter crewman who was drowned while trying to save the life of an unconscious American pilot, has been posthumously awarded the George Medal. Master Air Loadmaster David Edward Bullock was winchman with the duty Sea King crew of C Flight, No 202 Squadron when, on the morning of 18 November 1980, two USAF A-10 close support aircraft collided in mid-air near the Norfolk coast. The Sea King was scrambled from RAF Coltishall, Norfolk, and directed to go to the assistance of one of the American pilots, who had ejected over the sea and was still attached to his partially inflated parachute which was dragging him through the water.

Weather conditions at the scene were appalling, with icy seas and gale force

winds whipping up 15ft waves. Despite the obvious dangers MALM Bullock elected to be lowered by cable to assist the pilot, who was adjudged to be unconscious but still alive. He then hooked himself up to the pilot so that both men were attached to each other and the helicopter, before attempting to cut away the numerous shroud lines in which the pilot was entangled. Despite the numbing cold and buffeting waves he persisted in his efforts for several minutes, until a particularly vicious gust of wind caught the parachute canopy with such force that the rescue cable snapped under the enormous strain. The unrestrained parachute continued to drag both men erratically through the sea, periodically dragging them under. Initially MALM Bullock managed with great difficulty to keep the pilot's head above water but eventually he too lost consciousness. Subsequently both men were dragged through the water for some time, and were found to be dead when finally recovered.

Praising MALM Bullock's selfless sacrifice, the citation states that although he was well aware of the very dangerous situation created by the breaking of the rescue cable, 'he had every opportunity over a period of three or four minutes to disconnect himself from the pilot and save his own life. However, consciously and with conspicuous courage he chose to remain with the pilot in the hope of saving him'.

Swedish precision flying

Sweden came out top in the '4th World Precision Flying Championships' writes S. J. Bushell, winning both the team and individual awards. The victorious Swedish team consisted of A. Nylen in Tomahawk SE-ICC and J. Friskman and T. Krave (also the individual champion) both flying Cessna 152, SE-IHA. Second in the team event was Poland and third was Austria, with Poland also taking second and third places in the individual event — awarded to K. Lenartowicz and E. Popilev flying Wilgas SP-AFA and SP-AFB respectively.

Right: For the first time ever, RAF Jaguars visited Larissa AFB, Greece for a 10-day squadron exchange with the Hellenic Air Force (HAF) in late-July. Five of No 14 Squadron's Bruggen-based Jaguars were detached to Greece while four A-7 Corsairs of No 347 Squadron, HAF flew to RAF Bruggen, Germany. One of the HAF Corsairs, 159949, is seen at Bruggen alongside RAF Jaguar GR1, XX825 (foreground). Photo: RAF Germany

In all, teams from 14 countries as far apart as the US, South Africa and Iraq competed, with the two British teams finishing eighth and 14th.

Inverted Channel crossing

Nigel Brendish flew inverted across the English Channel in his modified Chipmunk (dubbed 'Mighty Munk' by the CAA) on 25 July. The aircraft is appropriately registered G-IDDY and the flight — on the 72nd anniversary of Bleriot's cross-channel flight — was in aid of the Muscular Dystrophy Association. It is believed that the feat has been achieved twice before, in the 1930s and 1950s.

Maiden flight of Piper T-1040 commuter

Piper Aircraft Corporation's new T-1040 turboprop commuter aircraft made its maiden flight on 17 July. The 11-seat T-1040 was in the hands of test pilot William H. Lawton for its 50min inaugural flight from William T. Piper Memorial Airport, Lock Haven, Pa. During the flight the aircraft was flown to an altitude of 10,500ft for a series of manoeuvres that included stalls, landing gear and flap operations, simulated approaches and avionics tests.

The T-1040 incorporates the fuselage of the Piper Chieftain with the wings, engines, nose and empennage of Piper's Cheyenne I turboprop. The aircraft, certified for one- or two-crew member operation, is powered by Pratt & Whitney of Canada PT6A-11 turboprops, each rated at 500shp. The T-1040 has now entered a Piper flight test and development programme aimed at obtaining Federal Aviation Administration (FAA) certification next February. Initial deliveries are scheduled for the spring of 1982.

Vulcan 25th anniversary

The 25th anniversary of the entry into RAF service of the delta wing Vulcan bomber was marked at RAF Scampton, Lincs on 25 July 1981 by a seven aircraft static exhibition and a four aircraft flying display before a large assembly of Service and industry guests attending the celebrations.



airnotes

The US Federal Aviation Administration (FAA) awarded the McDonnell Douglas DC-9 Super 82 its type certificate on 30 July 1981. Republic Airlines was scheduled to receive the first of the model in August.

The second McDonnell Douglas KC-10 tanker/cargo aircraft was handed over to the USAF on 30 July 1981 in ceremonies at the manufacturer's Long Beach, Ca facility. The aircraft was then flown to Barksdale AFB, La to join the first KC-10 delivered last March. Four more KC-10s are scheduled for delivery to the USAF this year and six in 1982.

On 31 July a SEPECAT Jaguar strike aircraft began flight trials at BAe Warton, Lancs equipped with the new Ferranti FIN 1064 Inertial Navigation System. The system has been ordered by the RAF for retrofitting into its Jaguar fleet during 1983.

David Perrin, piloting the Rothman's Pitts S25, won the British Aerobatic Association (BAeA) advanced-level aerobatic competition at Old Warden Aerodrome, Biggleswade in July. The contest comprised an 'Advanced Known Compulsory' sequence and a timed, four-minute 'Non-Aresti freestyle'. Second place went to Tony Bianchi in his Cap 20L, followed by John Harper (Zlin 526) and Eric Steenson, in the Cranfield Al.

A tactical exercise designed to provide realistic training for RAF, USAF and RDAF offensive support aircrews, took place over the Borders Region between England and Scotland on 4-6 August. The exercise, known as OSEX 4, also involved Army forward air controllers and RAF and USAF air defence aircrews. RAF Jaguars, Harriers and Buccaneers, USAF

A-10s and F-111s and RDAF Draakens flew up to 200 offensive support duties each day.

A new low-level training area for RAF and allied Tornados has been set aside in the northwest Scottish highlands. The Tornados will operate down to a height of 400ft (using terrain-following radar) for night/bad weather training.

Bell Helicopter Textron has received a contract from the US Navy to retrofit the TOW missile system on 28 Marine Model AH-1T SeaCobras. The twin-engine attack helicopters will be modified at Bell's Amarillo, Tx facility and delivery of the aircraft will begin in January 1983.

Airline Orders

Airline	Aircraft	No	Ordered	Delivery date
AirCal*	DC-9 Super 80	5-f	22 Jul 81	c-May 82
		6-o	22 Jul 81	n.d.
Air Florida*	Boeing 757	3-f	20 Jul 81	Sep & Oct 83
		3-o	20 Jul 81	1-84
Empire Airlines	Fokker F28 Mk 4000	1	c/o e-Jun	Mar 83
Kuwait Airways*	Boeing 747	1	30 Jul 81	Jan 82
Monarch Airlines*	Boeing 727	1	30 Jul 81	Dec 81
Satena*	Boeing 757	1	c/o Aug 81	May 83
South African Airways*	BAe748 srs 2B	1	Jul 81	(see notes)
Transbrasil Airlines*	Boeing 747 (EUD)	2	Jun 81	Apr & May 83
	Boeing 767	3	30 Jul 81	May & Jun 83

Notes

Airline Orders

Air Cal: The aircraft will seat 162 passengers and will be used on routes between California, Nevada, Oregon and Washington. AirCal currently operates 16 Boeing 737s and two DC-9 Super 80s; two more DC-9 Super 80s are scheduled for delivery in October.

Air Florida: The Boeing 757s will be powered by Rolls-Royce RB211-535 engines — an order worth over £20million to Rolls-Royce. The initial three aircraft will be powered by RB211-535C engines, which will later be upgraded to -535E4 standard. The aircraft on option are planned for delivery from the start with -535E4 engines. Air Florida's Boeing 757s will be used on routes connecting Florida and the Northeast of the USA, including services to Newark, Boston and La Guardia airport, New York.

Kuwait Airways: The airline's new Boeing 727 will accommodate 142 passengers — 16 in first class and 126 in economy.

Monarch Airlines: The airline has converted one of two options held on the type into a firm order. The first Boeing 757 delivery to Monarch will be in March 1983 with the other two aircraft following in April and May of the same year.

Satena: The first srs2B to be sold to South America. The announcement of the order was released only days before the delivery (see 'Airliner Deliveries' section of the table).

South African Airways: The order reported in Aug 81, p.343

Transbrasil Airlines: The company is the first non-US airline to order both the new Boeing models; Transbrasil already has on order nine Boeing 757s for delivery beginning in late-1984.

Airliner Deliveries

Airline	Aircraft	No	Delivered	Date ordered
Aeroflot*	EMB-121	1	Jul 81	n.d.
Air New Zealand*	Xingu Boeing 747-200B	2	Jun 81	Apr 80
Alaska Airlines	Boeing 737-200	1	Jun 81	n.d.
ALIA	Boeing 727	1	Jun 81	n.d.
Alitalia	Boeing 727	1	Jun 81	Nov 78
American Airlines	Boeing 727	4	Jun 81	n.d.
Ansett*	Boeing 727	2	Jun 81	n.d.
	Boeing 737-200	1	Jun 81	17 Mar 80
Avianca	Boeing 727	1	Jun 81	n.d.
Cathay Pacific Airways*	Boeing 747-200B	1	Jun 81	18 Oct 78
Continental Airlines*	Boeing 727	2	Jun 81	n.d.
CP Air*	Boeing 737-200	2	Jun 81	Jun 79
Hapag-Lloyd*	Boeing 737-200	1	Jun 81	Mar 80
Lufthansa	Boeing 737	3	Jun 81	n.d.
Mexicana	Boeing 727	1	Jun 81	n.d.
Olympic Airways*	Boeing 737	1	Jun 81	n.d.
Satena*	BAe748 srs 2B	1	Aug 81	(see notes)
Saudia*	Boeing 747 SP	1	Jun 81	n.d.
Tarom*	BAe One-Eleven srs 487F	1	28 Jul 81	15 Jun 78
Transamerica Airlines*	Boeing 747-200C	1	Jun 81	1978
Tunis Air*	Boeing 737	1	Jun 81	Aug 80
Western Air Lines	Boeing 727	1	Jun 81	n.d.

Notes

Airliner Deliveries

Aeroflot: The airline is a new Colombian executive air transport company.

Air New Zealand: The 2nd and 3rd Rolls-Royce RB211-524-powered Boeing 747s for the airline, are believed to be registered ZK-NZW and ZK-NZX (see Jul 80, p.296).

Ansett: The Boeing 737, the first in a 12-aircraft order (see Jun 80, p.249), is registered VH-CZM and is finished in the airline's new livery (see photograph in Sep 81, p.392). The Boeing 727s are VH-ANA and VH-ANB.

Cathay Pacific Airways: See Dec 78, p.584.

Continental: One of six Boeing 727-200s, N79746, destined for delivery to Continental Airlines this year.

CP Air: Completion of the four-aircraft order reported in Sep 79, p.412 (see also Jul 81, p.297 and Oct 80 p.441).

Hapag-Lloyd: The second Boeing 737 in the six-aircraft order reported in Aug 80, p.345.

Olympic Airways: The Boeing 757 is believed to be the airline's 10th example and is registered SX-BCK *Nereus*.

Satena: The delivery of the aircraft reported in this month's 'Airliner Deliveries' section. The contract for the BAe 748 srs 2B was placed by the Colombian Air Force and the aircraft has a 48-seat configuration that can be changed rapidly to mixed passenger/cargo or all cargo layout.

Saudia: The first of two Boeing 747SPs, HZ-AIF, on order to Saudia. The aircraft will operate on long-range nonstop intercontinental routes such as Jeddah-New York.

Tarom: The second of three BAe One-Elevens for the Romanian state airline as part of the manufacturing licence agreement between BAe and the National Centre of the Romanian Aircraft Industry (CNIAR). See Apr 81, p.153. A total of 230 BAe One-Elevens has been sold to 60 operators.

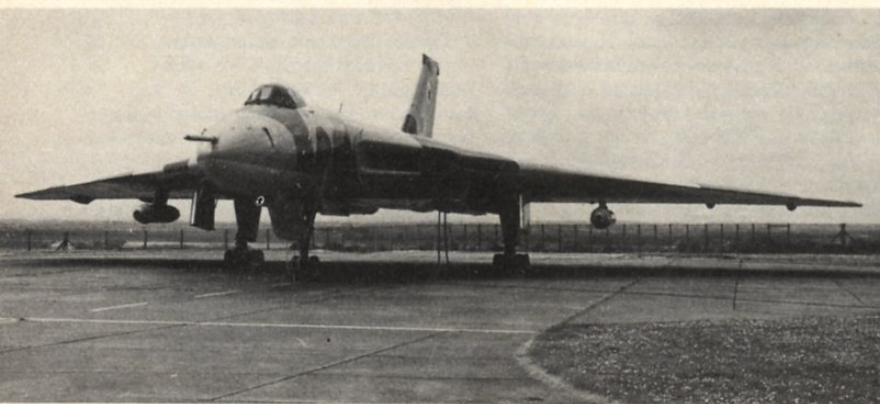
Transamerica Airlines: The aircraft is reportedly N743TV.

Tunis Air: The Boeing 737 is registered TS-IOF (see Jul 81, p.297 and Oct 80, p.440).

Key:

n.d.—no details, c—early months of year, l—later months of year, c—commencing date, f—firm orders, o—options, c/o—converted options, *—see notes.

Below: This Vulcan of No 27 Squadron, XH537, seen recently at RAF Scampton carries a pair of underwing pods which have been adopted to fit the aircraft for an additional role. Although often referred to as the Vulcan SR2 — a designation that dates back to the previous use of the Victor SR2 by No 543 Squadron — the aircraft operated by No 27 Squadron in the maritime radar reconnaissance role (see pp444-449 of this issue — Ed) are officially designated Vulcan B2(MRR). Photo: Argus Aviation Press



Compiled by A. J. Wright

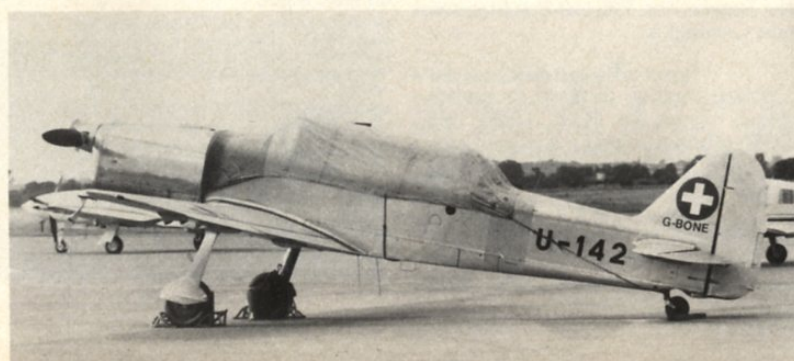
ANOTHER large batch this month, many of the contents being either microlights seeking refuge before the extended deadline, or balloons. The Ocset Mk 1 is an interesting item — did it escape from a Tesco checkout desk, if so which branch is its home base? It is not even 1 April.

Turning to saner entries, the first UK Dash Seven appears for Brymon. It will be used on the oil charter work in the North, although eventually the type should replace the Herald G-ATIG at Newquay. The Lamplough collection at Duxford is joined by a P-51D and a Spitfire IX. Both have been undergoing restoration for several years. The second Mustang is destined for Doug Arnold's Warbirds museum at Blackbushe.

Registration	Type	c/n	Owner or operator
G-BHLP	Cessna 441 Conquest	0239	Northair Aviation Ltd
G-BHNY	Cessna 425	0090	Northair Aviation Ltd
G-BIES	Maule M5-235C Lunar Rocket	7334C	William Procter Farms (N56394)
G-BIRG	MS880B Rallye Club	1237	Air Touring Services Ltd (F-BPSR)
G-BIWF	Warren balloon	013	P. D. Ridout
G-BIWG	Zelenski Mk 2 balloon	2401	P. D. Ridout
G-BIWH	Cremer Super Fitelines balloon	15-700PAC	G. Lowther
G-BIWI	Cremer WS-1 balloon	15-701PAC	P. A. Cremer
G-BIWI	Unicorn UE-2A balloon	81014	A. F. Langhelt
G-BIXI	Cessna 172RG	0861	J. F. P. Lewis (N9535B)
G-BIXL	P-51D Mustang	—	R. Lamplough (44-72216)
G-BIXP	Spitfire Mk IX	—	R. Lamplough (TE517)
G-BIXT	Cessna 182	67888	W. Lipka (N6397H)
G-BIXU	AA-5B Tiger	1184	Cabair Ltd
G-BIYT	Colt Cloudhopper balloon	344	E. Ten Houten
G-BIZW	Champion 7GCBC Citabria	157	R. Windley (D-EGPD)
G-BIZY	Jodel D112	1120	G. J. Allan & ptrns (F-BKUL)
G-BJAB	Ayres S2R Thrush Commander	2513R	Voygate Ltd (N4007G)
G-BJAK	Mooney M20C Mk 21	3116	J. Burford Wilson (00-CAB/00-VLB)
G-BJBC	Cessna TR182	01390	Rogers Aviation Sales Ltd
G-BJBM	Monnet Sonera I	MEA-117	J. Pickrell & ptrns
G-BJBP	Beech 200 Super King Air	BB-240	Eagle Aircraft Services Ltd (G-HLUB)
G-BJBR	Robinson R22	0154	Sloane Helicopters Ltd (N9081N)
G-BJBS	Robinson R22	0155	Sloane Helicopters Ltd (N9081S)
G-BJBT	Robinson R22	0156	Sloane Helicopters Ltd (N9081U)
G-BJBU	PA-23 Aztec 250	7305194	Sloane Helicopters Ltd (N40476)
G-BJBV	PA-28-161 Warrior II	8116279	CSE Aviation Ltd (N2913Y)
G-BJBW	PA-28-161 Warrior II	8116280	CSE Aviation Ltd (N2913Z)
G-BJBX	PA-28-161 Warrior II	8116269	CSE Aviation Ltd (N8414H)
G-BJBZ	PA-28-161 Warrior II	8116270	CSE Aviation Ltd
G-BJBY	Rotorway Exec	01-81	Rotorway (UK) Ltd

Registration	Type	c/n	Owner or operator
G-BJCA	PA-28-161 Warrior II	7916473	Link Services Ltd (N2846D)
G-BJCC	Unicorn UE-1A balloon	81010	R. J. Pooley
G-BJCD	Bede BD-5BH	003T	Brockmoor-Bede Aircraft (UK) Ltd
G-BJCE	Cessna F172P	2124	A & G Aviation Ltd
G-BJCG	Fournier RF-5	5127	Executive Air Sport
G-BJCH	Ocset I balloon	001	I. R. Bell & D. Harris
G-BJCJ	PA-28-181 Archer II	8190280	Frost & Frost (N8415X)
G-BJCL	Morane-Saulnier MS230	1049	B. J. S. Grey (EI-ARG/F-BGMR)
G-BJCP	Unicorn UE-2B balloon	81011	Unicorn Group
G-BJCS	Meagher Mk 2 balloon	812001	S. A. Fowler
G-BJDA	Skyvan Srs 3	SH1976	Short Bros Ltd
G-BJDB	Skyvan Srs 3	SH1977	Short Bros Ltd
G-BJDC	Skyvan Srs 3	SH1978	Short Bros Ltd
G-BJDD	Skyvan Srs 3	SH1979	Short Bros Ltd
G-BJDD	BAe 125 srs 700B	257142	Consolidated Contractors (UK Services) Ltd
G-BJDL	Rango NA-9 balloon	DL20	D. Lawrence
G-BJDN	AA-5A Cheetah	0794	Cabair Ltd (N26893)
G-BJDO	AA-5A Cheetah	0823	Cabair Ltd (N26936)
G-BJDS	British Bulldog balloon	AJC-12	A. J. Cremer
G-BJDU	Scruggs BL-28 Srs II balloon	81244	C. D. Ibell
G-BJDY	Unicorn UE-4A balloon	81012	Unicorn Group
G-BJDZ	Unicorn UE-1A balloon	81013	A. P. & K. E. Chown
G-BJEA	BN-2B Islander	2116	Pilatus BN Ltd
G-BJEB	BN-2B Islander	2117	Pilatus BN Ltd
G-BJEC	BN-2B Islander	2118	Pilatus BN Ltd
G-BJED	BN-2B Islander	2119	Pilatus BN Ltd
G-BJEE	BN-2B Islander	2120	Pilatus BN Ltd
G-BJEF	BN-2B Islander	2121	Pilatus BN Ltd
G-BJEG	BN-2B Islander	2122	Pilatus BN Ltd
G-BJEH	BN-2B Islander	2123	Pilatus BN Ltd
G-BJEL	PA-19 Super Cub (L-18C)	18-1988	H. J. Cox & D. Platt (EI-66/L-EILO/MM52-2388/52-2388)
G-BJEJ	BN-2B Islander	2124	Pilatus BN Ltd
G-BJEK	BN-2B Islander	2125	Pilatus BN Ltd
G-BJOY	BAe 125 srs 600B	256030	H. Goodman (G-BBEP)
G-BONE	Pilatus P2-06	62	Aeromech Ltd (U-142 Swiss AF)
G-BRIC	Cameron V-65 balloon	748	Astra Pharmaceuticals Ltd
G-BRYC	DHC-7 Dash Seven	0054	Brymon Aviation Ltd
G-BSIX	Cessna 401	0165	Culinar Ltd (G-CAFE/G-AWXM/N4065Q)
G-EORR	AS350B Ecureuil	1040	Colt Car Co (G-FERG/G-BGCW)
G-FARR	Jodel D150	58	G. Farr (F-BNIN)
G-FLEA	SOCATA TB-10 Tobago	235	Francis Barker & Son Ltd
G-HENS	Cameron N-55 balloon	740	Horrells Dairies Ltd
G-LANA	SOCATA TB-10 Tobago	109	Jerrard Saunders Donn (Solicitors) (EI-BIH)
G-MBAN	Eagle Microlite	2788	R. W. Millward
G-MBAO	Rotec Rally 2B	RM/1	R. Mayo
G-MBAP	Rotec Rally 2B	PL/1	P. D. Lucas
G-MBAR	Scout Microlight	389W	L. Chiappi
G-MBAS	Typhoon Tripacer 250	T18163	T. J. Birkbeck
G-MBAT	Hiway Skytrike	250/8	M. R. Gardiner
G-MBAU	Hiway Skytrike	100/7	M. R. Gardiner
G-MBAW	Pterodactyl Microlight	017	M. L. Smith
G-MBAX	Hiway Skytrike	25-P7	D. Clarke
G-MBAY	Skycraft Scout	341	J. Colapp & G. T. Wilkinson
G-MBAZ	Rotec Rally 2B	WSS-2	Western Skysports Ltd
G-NMAN	PA-31 Turbo Navajo	31-376	Machine Music Ltd (G-AXDD/N9284Y)
G-OULD	Gould Mk 1 balloon	AG-1	A. Gould
G-PSID	P-51D Mustang	31514	Fairoaks Aviation Services Ltd (N186G/44-63788)
G-THOM	Thunder Ax6-56 balloon	366	Thunder Balloons Ltd

Right: Following the recent sale of Pilatus P2s by the Swiss AF (see Sept 81, p420-421) several of the aircraft have found their way on to the British register including P2-06/U-142 now carrying the marks G-BONE. Photo: Simon Murdoch



airbooks

Aviation handbooks

Commercial Transport Aircraft and Military Transport and Training Aircraft compiled by Michael J. H. Taylor and Kenneth Munson, edited by John W. R. Taylor, published by Jane's Publishing Co (262pp and 272pp illus text respectively) at **£4.95 each**

Planes and Airports by Chris McAllister, published by B. T. Batsford Ltd (64pp illus text incl colour) at **£1.95**

Surviving WW2 Aircraft by Chaz Bowyer, published by B. T. Batsford Ltd (64pp illus text incl colour) at **£1.95**

The Airline handbook — 1981 edited by Paul K. Martin, published by Aerotravel Research (424pp illus text) at **\$11.50***

The Jane's pocket books, **Commercial Transport Aircraft and Military Transport and Training Aircraft**, are rebound (hardcover) reprints of editions that appeared in 1978 and 1979 respectively. Each individual aircraft subject (some 124 and 130 in all) is given two pages — one for a black and white photograph and the other for general arrangement drawings and specification details. These books remain a useful source of quick reference material.

Following the publication of his book 'Aircraft Alive', Chris McAllister has produced another interesting, though more generalised, volume in **Planes and Airports**. The book conveys some of the 'ins and outs' of aircraft and airport operations; from landing to take-off, servicing and maintenance, navigation and aircraft performance. The photographic content is adequate with many of the colour and black and white illustrations being drawn from manufacturers' and airlines' files. The format of this soft-cover book is 8in by 8in — as is that of another Batsford publication, **Surviving WW2 aircraft**. Thirty WW2 types are featured and although the selection is only representative of some of the existing historic aircraft in the UK, there are several surprising omissions; for example the B-29 Superfortress and the Heinkel He111 have not been included whereas the lesser known He162 has. The text outlines the details of the aircraft and a colour photograph of each is also provided. An appendix contains summary information on UK Aviation Museums and collections.

The **Airline handbook** is a complete alphabetical listing of the world's airlines.

* Available in the UK from: Airline Publications & Sales, Noble Corner, Great West Road, Hounslow, Middx TW5 0PA.

There are nearly 1,300 entries — from AAA Air Enterprises to Zantop International — and data given include the airlines' bases, aircraft operated and routes flown. The visual appearance of the book has been marred by the bad cropping of many of the black and white photographs — resulting in the omission of aircraft noses and tails.

MCA series

V-Bombers — Modern Combat Aircraft 11 by Robert Jackson, published by Ian Allan Ltd (122pp illus test incl 8pp colour) at **£6.95**

V Bombers represents a slight break of tradition in the publisher's MCA-series, as for the first time three (rather than one) aircraft types are featured — the Vickers Valiant, Avro Vulcan and Handley Page Victor. These aircraft arose out of an RAF Bomber Command requirement for strategic jet bombers to carry Britain's nuclear weapons over medium ranges. Although the early development of all three aircraft was marred by crashes (hardly surprising in view of their revolutionary design), the flight test programmes bore fruition and the designs entered production. The V-Force provided trojan service in the RAF and the distinctive shapes of the Vulcan and Victor are still very much evident today.

In his book Robert Jackson charts the history of the V-Force in an essentially factual manner. 'Development and testing' and 'in service' sections are featured for each of the three aircraft and additional chapters detail the 'origins of the V-Bombers', 'Blue Steel and Skybolt' and 'V-Force operational procedures'. As with all the MCA-series, the pictorial content of the book is important and 'V-Bombers' contains some fine photographs.

UK aviation histories

The Army and Aviation — a pictorial history by Bruce Robertson, published by Robert Hale Ltd (255pp illus text) at **£9.95**

British Aircraft Corporation — a history by Charles Gardner, published by B. T. Batsford Ltd (320pp text plus 32pp illus incl 8pp colour) at **£12.50**

The **Army and Aviation** is a pictorial survey of the impact of air warfare on all aspects of army operations; ranging from the first British military ballooning experiments in 1878, to the current involvement of the AAC with helicopters. Throughout its long history, observation has always been the major role of army aviation and to fulfil this task the service has utilised balloons, kites, biplanes, monoplanes and (since the late-1950s) helicopters — the versatility of the latter also allowing battlefield support and anti-tank opera-

tions. Bruce Robertson's book combines a superb selection of photographs with an informative, caption-type text.

Charles Gardner's book **British Aircraft Corporation** recalls the achievements and disappointments of BAC in its somewhat chequered 17-year history. The Corporation was formed in 1960 by the amalgamation of Bristol Aircraft, English Electric, Hunting and Vickers. Early in its career BAC suffered a severe setback with the cancellation of the TSR2 — a programme on which it had planned much of its future. BAC nevertheless survived and went on to produce the One-Eleven civil airliner and to pioneer international collaboration on the Jaguar, Concorde and the MRCA, later Tornado, project. In 1977, the Corporation — together with Hawker Siddeley and Scottish Aviation — was formed into British Aerospace. Sir George Edwards, one time chairman of BAC, has written the foreword to a book that is largely weighted towards affairs at boardroom level and in Whitehall. There are some fine photographs (notably those of Arthur Gibson) among the 32pp of illustrations.

Aviation guides

Aviation Space dictionary edited by Ernest J. Gentle, published by Aero Publishing Inc* (272pp illus text) at **£12.95**

Flight briefing for pilots — 7; The IMC rating manual by N. H. Birch and A. E. Bramson, published by Pitman Books Ltd (375pp illus text) at **£7.95**

Nicely finished in a simulated brown leather covering with gold lettering, **Aviation Space dictionary** is now in its sixth edition — a sign of the ever expanding vocabulary that is evolving with the aerospace industry. Each term is adequately explained and listed in alphabetical order; synonyms are also arranged alphabetically but are supplied with cross references to the definition. As a US publication it should be noted that the flavour of the terminology and the word spellings are firmly North American.

Flight briefing for pilots — 7 is a valuable and concise aid to those private pilots who wish to obtain their IMC (instrument meteorological conditions) rating; the manual, however, also provides interesting reading for any would-be pilots who require a basic knowledge of flight planning, meteorology, flight instruments... etc. The book is divided into two sections — Part One, Ground Training and Part Two, Flying Training. Useful explanatory diagrams are featured throughout.

*Distributed in the UK by Arms & Armour Press, Lionel Leventhal Ltd; 2-6 Hampstead High Street, London NW3 1PR.



Vulcan MRR *sortie*

Brian Goulding

'HOW WOULD you like to fly in a Vulcan?' When an RAF officer friend put this to me over lunch one day a few months ago, I viewed the offer with some scepticism, knowing only too well the difficulties involved in accommodating non-service personnel aboard military aircraft, particularly when space limitations and operational demands prevail. The prospects of flying in such a mighty machine as the Vulcan were exciting, yet at the same time somewhat awesome. Having flown previously in Lancasters, Lincolns and Shackletons, I had long cherished the hopes of flying in a Vulcan to complete the 'set', although the chance seemed to be slipping away with threats of withdrawals looming. But the occasion was at last to materialise and the opportunity of a sortie with a No 27 Squadron crew in a Vulcan B2(MRR) from RAF Scampton was accepted with alacrity.

Hitherto, little has appeared in print on No 27 Squadron's specialised role, due mainly to the still-classified nature of much

of its work. The squadron is no stranger to the Vulcan, having first converted to it in 1961, flying the Blue Steel version until 1969, then reverting to conventional free-fall bombing until disbanding in March 1972. The squadron re-formed in November 1973, specifically for the then highly secret maritime radar reconnaissance (MRR) task, this being the first time the Vulcan had been used in other than the bombing role. Operational status was achieved by March 1974.

As the MRR title suggests, the work of the squadron is concerned almost wholly with surface ships at sea — including submarines when they are on the surface (submerged submarines remain strictly the province of the maritime patrol aircraft, or helicopters). No 27's primary objectives may be summed up the acronym SLIST: Search, Locate, Identify, Shadow, Tac-Di (tactical direction of attackers). Its area of operations covers several million square miles; from Spitsbergen (north east of Norway), along the lower edge of the polar ice cap across the north of Iceland to the

southern tip of Greenland; down the half-way line of the Atlantic to the Azores, across to Gibraltar; up through the Bay of Biscay, taking in the sea areas round the UK — the Western Approaches, Channel and North Sea. The squadron plays an important part in NATO's constant vigil over the movement of Warsaw Pact vessels, both military and civil. For operational purposes the sea areas are divided into 'boxes', Box 1, for example, being to the north and north-east of Scotland, from Iceland to Jan Mayen Island at the edge of the ice-cap; in round terms, some 1/3 million square miles of the world's most inhospitable ocean, but a particularly vulnerable, and well trafficked sector, the whole of which can be covered in two Vulcan sorties, and fairly adequately in one.

In addition to the 6 'boxes', the Mediterranean also has to be watched, the Russians having well-established sea anchorages, and the Vulcans fly regular 'Rangers' to Cyprus. While at the time of writing (March 1981) No 27 Squadron's

fleet of aircraft was able to adequately cover its allotted areas, a cutback and reduction in crew strength had already been announced.

For the MRR role the Vulcan needed only the minimum of modifications to the standard bomber, and has proved an admirable choice. Its speed, and long range and endurance, using two bomb bay fuel tanks the size of locomotive boilers, fitted as standard on No 27 Squadron's aircraft, make it ideal for the long transit legs and extended search and shadowing duties. It is a most stable and reliable operational platform, able to maintain a very large area of surveillance. One of the main tasks of the Vulcan crews is primary location of 'hostile' vessels, using the highly efficient, well-proven H2S Mk 9 radar, a direct development of WW2 equipment. The aircraft is extremely flexible, possessing all-weather capability and able also to operate at medium and very low levels, as I was to experience.

The MRR world is one of accurate flying to well-defined patterns, not only to

seek out hostile vessels on a 'nil-intelligence' basis, but also to shadow and plot movements of known contacts or suspects. Names such as Big Box, Small Box, Crisp Box, Aspids, Lopros, Selpros, Trombones, give the role a language of its own. In two hours, at 40,000ft, a Vulcan crew can seek out and report the progress of all shipping between the Shetlands and Iceland or Norway. In a normal 6 1/2-hour sortie, including transit times, an area of some 200,000 square miles can be surveyed, flying four legs of 800 miles each. At 40,000ft the radar picks up everything but the smallest fishing boats, and certainly misses nothing of any military significance.

Every radar contact will be reported back by radio to one of NATO's Maritime Headquarters (MHQ), such as Stavanger (Norway), Pitraevie (Scotland) or Keflavik (Iceland), in the north. There are other MHQ's near Lisbon, and at Plymouth, etc. Nil returns are also of vital importance. The radar screen (or tube) is photographed at regular intervals for later interpretation

Left: Vulcan B2 (MRR), XH534, of No 27 Squadron at low level and overflying a North Sea oil rig. Based at RAF Scampton, the specially modified Vulcans perform maritime radar reconnaissance (MRR) duties.

Photo: No 27 Squadron, RAF

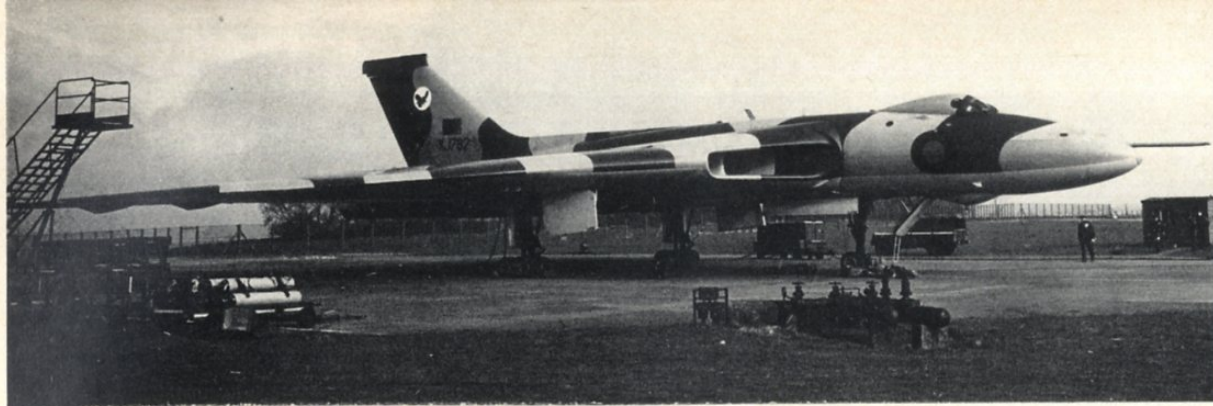
back at base, and the pictures will show the profusion of returns from ice, cloud, radio/radar 'noises', and jamming through which the experienced radar navigators (nav/radar) need to be able to see.

One regular feature on such sorties is the Russian 'Kara' class cruiser which plies continually back and forth across the Norwegian Sea between Jan Mayen Island to abeam Andoya (Norway) on defensive surveillance in the constant cat and mouse watch which goes on between East and West.

Sometimes the Vulcan will be brought down to low level for a positive visual identification of the vessel (a Selpro); or another aircraft may be called in to do so (a Lopro). This may be a maritime patrol type, such as Nimrod, P-3 Orion (Dutch, Norwegian, US) or Atlantic (French, Dutch, German); or it may be one or more Buccaneers, Canberras, or Jaguars, which would also carry out the attack in war conditions, with the Vulcan returning, or remaining, upstairs to act as airborne control and guidance centre for the attackers (Tac-Di).

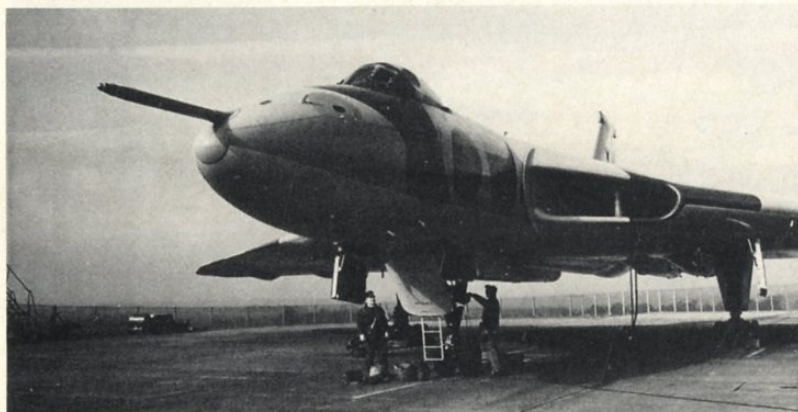
On a Selpro, Warsaw Pact ships are photographed by the Vulcan pilots through their side windows from as close-in-as possible, using 35mm hand-held cameras; and whenever possible, from directly overhead, using the vertical F95 (4-inch) camera mounted in the visual bomb aimer's position under the flight deck. Ship recognition plays a very important part of crew training, and on a Selpro at low level, in good weather, silhouettes can be identified from 10 miles. Some of the quality of photography is outstanding, and it is amazing what can be gleaned from close scrutiny of the results.

Other tasks include the location of specific vessels using known intelligence; listening out on secondary sensors to add to the 'raw' radar picture; and identification drills using crew skills to interpret signals from surface contacts. (Based on knowledge of radar carried, this can often lead to establishment of positive identity of ship, or certainly its type). Shadow posture sorties involve flying the same track as a known fleet or contact, just out of its missile range, but within the Vulcan's low-level radar range, for up to 5 1/2-hours, reporting regularly to MHQ and/or allied vessels involved. This long duration shadow capability, which may be lost once the Vulcans are gone, is considered of vital importance.



Above: The aircraft in which the author flew, XJ782, standing at its RAF Scampton dispersal point and...

Right: ... the aircrew carrying out external checks prior to a sortie. Although the terrain-following radar (TFR) has been removed from the nose, the Vulcans of No 27 Squadron retain the refuelling probe and the 'high speed' gloss paint finish. Photos: Brian Goulding



The Vulcan's Bombing and Navigation System (BNS) includes:-

HRS — Heading Reference System

MFS — Military Flight System (indicating direction, attitude, etc, used for ILS approaches)

NBS — Navigation Bombing System (including the H2S Mk 9)

GPI — Ground Position Indicator Mk 6, (giving continuous lat/long readings)

Accurate navigation over large sea areas is facilitated by Loran C and Decca Doppler 72, used in conjunction with H2S fixes on coastlines, islands, etc. Astro navigation is also practised regularly on the assumption that ground beacons would be early victims in the event of war. On a recent astro exercise, an accuracy to within 3 miles in 3 hours' flying was achieved.

The H2S has a lock-on (stabilised) capability, enabling contacts to be 'fixed' on the screen for as long as required. The GPI Mk 6, again a development of WW2 equipment, provides continuous lat/long using output from the Doppler updated by fixes from H2S or Loran C. A number of the displays and instruments on the navigators' panels would be recognisable to the later-war Lancaster Nav-Is and Nav-IIs, and certainly to their Lincoln successors.

The tactical techniques have been devised largely by the Vulcan crews themselves, most of them very experienced bomber men. On my visit, there was only one non-bomber nav/radar on the squadron. Most have served on V-bombers previously, some also on Lancasters, Lincolns and Washingtons. There is in evidence grey haired, bespectacled reliability-men who know their job inside out.

It is on visiting the MRR Cell in Scampton's Operations Block that the cold reality of the situation is brought home. The Cell is the intelligence centre for No 27 Squadron, manned by a flight lieutenant and two senior NCO's, maintaining the link between the squadron and higher commands through which operational requests are routed from ships at sea, NATO units, other RAF squadrons, etc.

The Cell is responsible for intelligence on 'hostile' vessels. Instead of aircraft recognition pictures, the walls and tabletops are full of enlargements of every type of vessel of the Warsaw Pact countries, both civil and military. The visit to this small operations sub-centre was a very real, and somewhat chilling experience.

It was in here that the main briefing was to take place for the flight on which I was to be an observer, on Friday 20 March. Having spent the whole of the previous day at Scampton being kitted-out, briefed, medically examined, practising emergency drills, etc, the great day dawned bright and clear. A call in the Mess at 06.00hrs, to arrive at the crew briefing room in 'Ops' by 06.30hrs, to be confronted by three slight panics. The regular air electronics officer (Steph Episcopo) had suffered a bad toothache all night, and was not fit to fly, so a stand-in had been arranged, (Flt Lt Gordon Jones); the Captain Wg Cdr Tony Pearson (the squadron CO) would be a

little late as he couldn't find his car keys; and the ship which was to be our 'target', HMS *Anglesey*, had put in to Grimsby. It was assumed this was due to unserviceability, but later found to be for a more honourable reason — the arrest of a foreign fishing boat caught trespassing in home waters. At this early hour everyone was working a little hard to sound reasonably bright, but even our ebullient nav/radar (Sqn Ldr 'Steve' Stevenson) was somewhat subdued.

Without HMS *Anglesey*, the crew would have to find another suitable ship for our 'playmates', who were to be three Canberras of No 360 Squadron from Wyton. The best gaps in the weather looked like being over the North Sea, so a rendezvous off Spurn Point was decided upon. The North Sea is a problem area for the navs, who paid considerable attention to threading a way through the numerous tactical air warfare ranges, danger zones, oil rig helicopter lanes, Airway Blue One, etc.

Wg Cdr Pearson would be flying as captain, but as acting co-pilot in the right hand seat, so to him fell the job of calculating weights and speeds, as is the custom. The crew's normal co-pilot, Flt Lt Steve Parfitt (since posted on an instructor's course) was to fly in the left seat as acting captain. The outward route from Scampton was to be via Grimsby, VFR, below 2,000ft. The take-off weights were 111,500lb including crew and bomb bay tanks (empty), plus 72,600lb of fuel, for a

total of 184,100lb, as against the max permitted all-up weight of 204,000lb — almost three times the weight of a fully-laden Lancaster.

At 07.15hrs we trooped into the MRR Cell for a final check on details of the sortie, briefed by Flt Lt 'Jay' Norman. The task was to be an Aspid/Lopro with Canberras of No 360 Squadron. Callsigns and frequencies (HF and UHF) were allotted, ours to be '673 Oscar Kilo'.

The only Warsaw Pact military vessel known to be in the area was the Polish training ship *Wadnick* — if we saw it, please photograph. A final crew briefing at 07.25hrs conducted by Flt Lt Parfitt, with each member contributing. Then into the aircrew dining room for a most welcome breakfast at which I took care to drink only one cup of tea against my usual three, 'facilities' in the Vulcan being somewhat limited.

The next job — dressing for the flight in a locker room seemingly full of huge men struggling into flying clothing. For me, it was the first experience of wearing a rubber immersion suit, with its close fitting neck and wrists, rubber feet, and almost impossible zips at the strangest angles in the strangest places. Under this, a thick one-piece 'bunny suit', the whole giving an initial impression of weightlessness, soon corrected by donning the surprisingly heavy Mae West. Thick woollen, knee-length socks, heavy flying boots, and chamois gloves completed the outfit, plus of course, flying helmet, oxygen mask, and close-fitting bone dome, all of which must have doubled my weight. With hands full — parachute and harness, personal survival pack and dinghy (PSP), nav bags, camera boxes, flying rations etc, we were ready to go. Into the crew bus at 08.30hrs, and out to dispersal, to be welcomed by the crew chief and his men. It was a beautiful morning on what had already seemed a long day.

Time for a few pictures round the dispersal. Even in the wet suits, it felt cold up on the Lincoln Edge. It took thirty minutes or so to stow all the gear, complete external checks, and get aboard ourselves, pilots first, strapping into their ejector seats; then the three rear crew, and me the last, trying to stay well out of the way to the right of the hatch on the small 'step' which was to be my seat, feeling rather helpless amid all the preparatory activity. There is little room to spare in a Vulcan. The back of the co-pilot's seat rose way above me, his right foot being just visible on the rudder pedal. I thought of the seat going 'bang' only a few inches from my right ear.

A few feet away, above and to my left, the three rear crew were already in position, facing backwards, nav/radar left (ie starboard side of the aircraft), nav/plotter centre, and AEO right, almost shoulder-to-

shoulder, their seats of a swivel-type for ease of access and — more importantly — escape. The blackout curtains were already drawn over the small circular side windows in the nav compartment. I noted that the navs' seats were light green, otherwise all the interior was black — semi matt, and well-worn, just like a Lanc or Lincoln. Amazingly, too, the Vulcan has the same distinctive 'Avro smell'. The whole of the panels in front of, above, and to the side of the three rear crew are crammed full of equipment with barely a square inch to spare.

The nav/radar broke off from his equipment checks to help me into my parachute, and to clip on the PSP which will also be my seat cushion; then with the all-important connections of main and emergency oxygen, intercom etc. Horror of horrors — no sound in my helmet, so a frantic change of leads. It never ceases to surprise me how the sense of urgency builds up before a flight in a military aircraft. However much spare time there seems to be available at the start, the final half hour before take-off evaporates rapidly, and there is always the last minute snag, which at 09.10hrs, with 20 minutes to take-off, involves me. The start-up of the engines heightened this sense of urgency. I could just see the first pilot's left hand reaching slightly backwards to the starter buttons, and through the open front door below me, hear the whine of the first Olympus 200 Series engine as it came to life, while Steve struggled with my helmet. After much fumbling it was discovered to be no more than a faulty jack plug connection for the long intercom lead which would enable me to move around a little when airborne.

A last visit from a ground crewman for removal of ejector seat pins, ladder

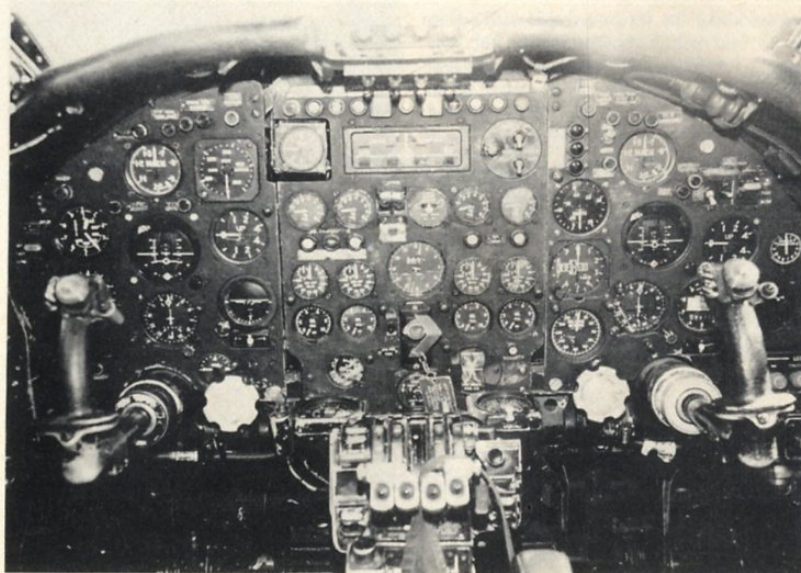
removed, a final glance down at the nosewheels and terra-firma before the hatch is closed by the Nav/radar. We are locked into our 'other world'.

I had always thought a Vulcan had a sinister look about it from certain angles outside, but inside it was distinctly so — dark, cramped, suddenly strangely quiet, and a little unreal. 'A coalmine with switches' is how it had been aptly described to me. The crew were able to settle down now, the equipment in the rear having become fully alive, and being subjected to innumerable checks and cross-checks, quietly, unhurried, but quick and concise. Amid the hum and whine of electrics, there was only the slightest suggestion of engine noise and vibrations; plus, of course, the metallic voices on the intercom, pilots going crisply through a long list of checks. The three rear crew are able to converse reasonably normally with each other without intercom, thus leaving it free for pilot/tower chat at this stage. I was very relieved to be able to acknowledge the check call, 'No 6 — OK'.

A rumble as the bomb doors were closed on our extra fuel tanks, no other 'stores' being carried, and at 09.25hrs! 'Scampton Tower clears 673 Oscar Kilo for taxi, runway 23, right hand, QFE niner niner wun'.

We moved, an immediate brake check stopped us dead, with a sharp dip of the

Below: The cockpit of Vulcan B2 (MRR) XH534, showing the throttles (centre bottom) and the two pilots' control columns; an aircraft the size of a Vulcan would normally have a more conventional control wheel, but the much smaller fighter-type column was decided upon to facilitate the use of ejection seats. Photo: Brian Goulding



nose. Despite the wet suit, the inside temperature was cool and comfortable. A final tightening of harnesses and checks of connections as we were given clearance to line up on runway 23, with the wind 250°/22kts. I was sitting on my step, spellbound. A call from the co-pilot — 'watch ears, pressurising'. The time — 09.30hrs; brakes off, a surge forward, a brief, muted, rending roar from the engines, a startling thrust sideways for me, and we are away, with the nav/plotter, Sqn Ldr Ken White calling the speeds — '60kts' in no time, '145kts V₁', rotation speed, nose up, the steep angle obvious even without any visual outside reference, and we were airborne within seconds, everything suddenly quiet and smooth, with only the gentle whistle and whine of electrics and equipment to remind me that we were in such a vast machine. Two 'clunks' as the wheels came up, and an immediate right turn for a downwind departure. Scampton's local radar called for a sudden turn to the left to avoid an unidentified contact, then we headed for Grimsby at only 1,500ft to stay below cloud, the Vulcan riding the slight bumps beautifully. The co-pilot had switched to bomb bay tanks immediately after take-off. Soon across Grimsby, and over the Humber estuary, again being warned to take evasive action to avoid a pair of Hunters returning off the ranges. At 09.40hrs, the nav-radar called the first contact, and at this point I was permitted to release my PSP catches, and climb the vertical ladder behind the two pilots' seats. Though still heavily weighed down by the parachute, harness, and Mae West, I was able, by wedging my helmet against a bulkhead, to just peer between their shoulders.

Flt Lt Parfitt eased the Vulcan down to about 500ft over the turquoise sea, and the wake of our contact came into view. As we passed along the starboard side of the ship — lo and behold a Russian tanker, red band on funnel, with hammer, sickle and all! What better 'target'. Photos were taken by the pilot with the hand-held Canon AE1 on the first pass which was only slightly above mast height, then another run at 1,000ft overhead for pictures on the F95, supervised by the nav/radar leaning into the nose, looking through the circular downward/forward vision panel, giving guidance to the pilot — 'Right wing down a bit — a little more — steady, steady — camera — now', and the nav/plotter fired it by remote control, 8 frames/sec, as we passed over the tanker.

It was then time for us to take our station for the rendezvous with the first of our Canberras, and up we went, effortlessly, at about 4,000ft per minute to 23,000ft under the control of Border Radar, to whom we identify ourselves as '673 Oscar Kilo, military 4-jet operating

with playmates'. The blinds behind the pilots' seats were let down to darken the rear compartment even further. We entered our trombone pattern at 400-450kts with the blip of the Russian tanker locked on to the H2S Screen. At 10.10hrs, contact was established off Flamborough Head with the first Canberra, a T17 'Lima Romeo Five Zero', with all radio communications being handled by our AEO. It is he who transmitted the 'Disports', passed to him by the nav/radar, enabling 'Lima Romeo 50' to be placed in position to find and

carry out a mock attack on the ship, which the Canberra crew succeeded in doing first time. All the time the nav/plotter monitored the exact position of the Vulcan in relation to airways, danger areas, etc.

The AEO asked the Canberra crew for the identity and nationality of their target. Getting a negative reply, they were asked to go back and do so. On one of our runs, looking down through the glass panel, we clearly spotted the ship 23,000ft below through a gap in the clouds.

At 11.00hrs a welcome request to pass up the rations — chocolate bars, apples, orange juice, etc, which tasted particularly good, before setting-up our second 'playmate' for its attack. As we turned at the ends of our pattern, shafts of sunlight passed across the cabin, but otherwise the movement of the aircraft was almost imperceptible. In the darkened rear compartment, the three crew were working hard with few moments to relax. In front of the AEO the tail-warning radar blinked constantly, like a green eye of an owl, and the secondary ground radar sensor twinkled. The AEO's panels included the 'window' (or chaff) dispenser controls — no shovelling it manually down a chute

these days; also, all voltage and electrical controls.

Our final playmate, 'Lima Romeo 36' checked in, and was duly disported towards its target from its release point about 40 miles distant. After the 'attack' the Canberra's crew was asked by the AEO for identity of target — name and nationality. Roars of laughter from the Vulcan crew at the reply: 'not known — didn't want to scare the crew by flying too close'. '36' did come alongside us for some air-to-air pictures, but my only view of it was through the sextant sights.

At midday we were off-task and descended to 400ft over the sea, 80 miles off the east coast. At 240kts it was very smooth and quiet, heading for the contacts passed to us by the nav/radar, which included some small fishing boats, probably out of Whitby or Bridlington. I wondered what the crews thought as our huge bat-like shape approached. A much larger contact — *Gonex*, a huge Shell tanker, empty, moving surprisingly fast across our track. This was real Shackleton-type stuff. Steve Parfitt was doing the flying, left hand on the fighter-style control grip, right hand free for

throttles, etc. The Vulcan is obviously responsive, particularly in the roll, which is immediate. It has to be watched a bit in the turns, especially at this low level, as height can soon be lost, but its handling qualities are impressive.

We were to have looked at an oil rig, but ran into some rain squalls — no messing about at this height in anything other than good visibility, so an immediate climb was initiated. At 250kts, and 3-4,000ft per min, the aircraft climbed effortlessly back up to 11,000ft. A practice emergency PAN call to Border Radar, who suggest Newcastle as our nearest diversion. The pilot asks the controller for RAF Leeming instead, where we do a radar approach and overshoot before heading south for Scampton, and a few rollers.

This plan was thwarted because an Andover was busy calibrating the landing aids. Waddington was also out for the same reason. For the landing back at base, Wg Cdr Pearson took the controls for a practice asymmetric radar approach, with the two port engines throttled right back. Approaching at 145kts, a perfect touchdown was made, with the nose held high for aerodynamic braking effect until

80kts, when the nosewheels were firmly lowered, gentle braking bringing us down to taxiing speed in only one third of the runway length, after a trip of 3hr 45min.

The films were collected immediately the door was opened at dispersal, and the negatives were available for our inspection at the MRR Cell on our return there only 30 minutes later. The fresh cool air of Lincolnshire smelt good and everything seemed extra bright after the darkened interior of the Vulcan. What a relief to shed that parachute and harness, and to remove bonedome and flying helmet. However, the immersion suit had not proved nearly as uncomfortable as I had feared.

If I had been looking for comparisons with the piston-engined heavies, there weren't many. The Vulcan is a whole world apart from them. It may be nearing the twilight of its operational life, which now spans 25 years, but it is still a potent machine; the only one in the RAF with the range and capacity which has been — and would appear to remain — so vital to this country in both the bomber and MRR roles. Long may it continue to serve. As for the men — well, they don't change much, certainly not in spirit, skill, and devotion to their work. Let there be no doubts about their state of readiness. For me, it was a great experience — something extra special, and a memorable way to achieve the 100th type in my flying log book.

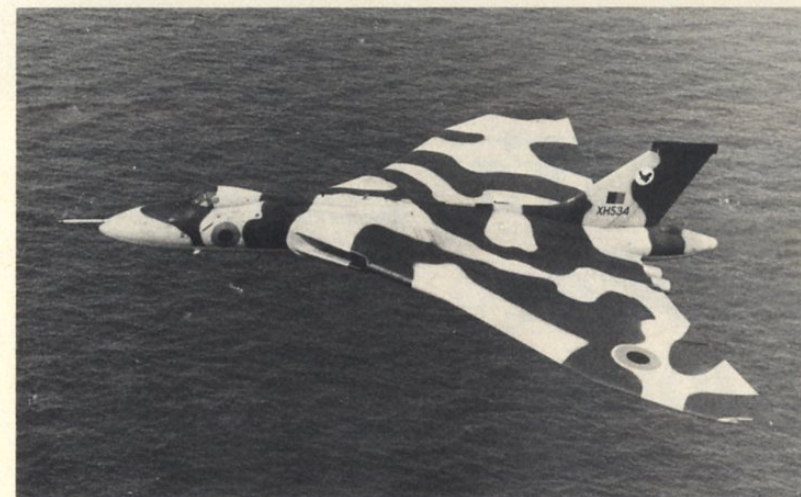
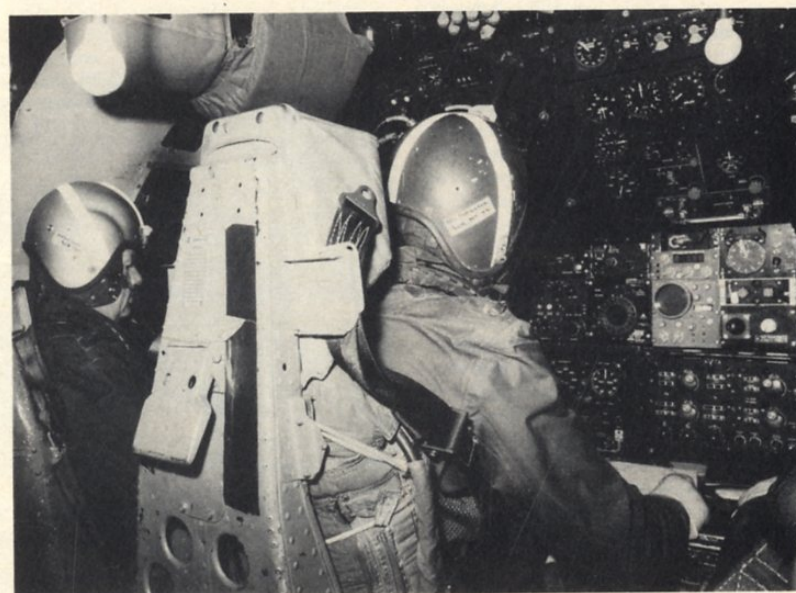
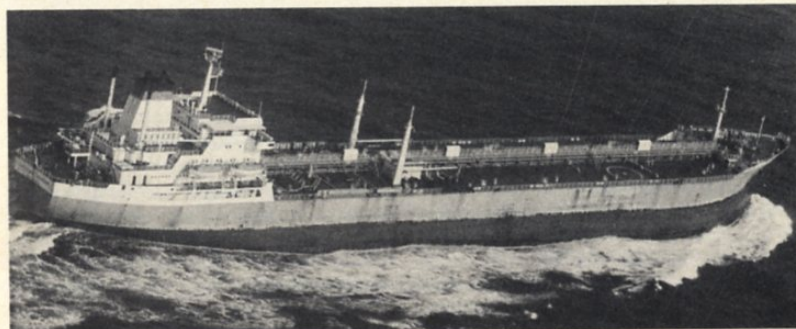
Acknowledgements

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Below: The Russian tanker referred to in the article, photographed from the first pilot's side window by Flt Lt Parfitt.

Bottom: This view of the rear-facing navigation/air electronics desk gives some idea of the confined layout inside the Vulcan. Left is the Nav/radar and centre is the Nav/plotter; the Air Electronics Officer (AEO) position is to the right, out of picture.

Photo: No 27 Squadron, RAF



Above: One of the oldest Vulcans still in service is XH534, modified to B2 (MRR) standard. Note No 27 Squadron's insignia (unofficial version) on the tail — a green flying elephant (Walt Disney's Dumbo). The elephant in the official crest commemorates the first type of aircraft used by the squadron from December 1915, the Martinsyde G100, commonly known as 'Scout' but also as 'Elephant'. Photo: Peter Stevenson MoD

Right: The crew of XJ782 — '673 Oscar Kilo'. From left to right are: Sqn Ldr Steve Stevenson (Nav/radar), Sqn Ldr Ken White (Nav/plotter), Brian Goulding, Flt Lt Gordon Jones (AEO), Wg Cdr Tony Pearson (Capt — CO of No 27 Squadron) and Flt Lt Steve Parfitt (Co-pilot).

Photo: Brian Goulding





TIGER MOTH's Golden Jubilee celebrations

R. A. Nicholls reports on the de Havilland Moth Club Rally — Henlow & Cranwell, 11-12 July

AT 09.45hr on 10 November 1931, six DH82 Tiger Moths took-off from the de Havilland works at Stag Lane, Edgware, and headed north towards RAF Grantham, Lincs where they landed 65min later. That unremarkable event was the first delivery of Tiger Moths to the RAF and marked the introduction into service of the best known trainer of all time, a type destined to remain the mainstay of *ab initio* pilot training until superseded by the Chipmunk in the late-1940s and early-1950s.

Developed from the DH60T, the DH82 first flew on 26 October 1931. From the original design the type underwent a

change of engine from the 120hp Gipsy III to the 130hp Gipsy Major I, replacement of the upper rear fuselage fabric by plywood decking, and other minor changes to become the DH82A in 1933.

Tiger Moth production approached 9,000, built in the UK, Australia, Canada, New Zealand, Norway, Portugal, and Sweden, and for many years the type saw service on a truly worldwide scale. The release of vast numbers of military Tiger Moths from 1947 onwards saturated the market, and the type was the standard mount of private pilots, crop sprayers, clubs and flying schools throughout the 1950s and beyond. Most retained the

Above: A nostalgic scene at Cranwell North on 12 July during the de Havilland Moth Club (dHMC) rally — as viewed from Jackaroo G-AOIR. The aircraft airborne are from left to right: Tiger Moth G-AJOA, Jackaroo G-APAM and Tiger Moth G-ACDJ. All photos by the author

familiar appearance but there were several attempts to provide an enclosed cockpit, culminating in the four-seater Thruxton Jackaroo.

Today the Tiger Moth still holds an indefinable fascination for enthusiasts the world over, and devotees are catered for by the de Havilland Moth Club. The dHMC provides a focal point for DH owners and enthusiasts, and organises rallies and events annually throughout the summer months, including one major event to commemorate a significant DH-related anniversary.

Clearly 1981's major event had to centre on the Tiger Moth's 50th anniversary, and the plan was to stage a multi-Moth re-enactment of the 1931 delivery flight, following the original track as closely as possible. Stag Lane aerodrome has long since been built over, while RAF Grantham is now Prince William of Gloucester Barracks, so the BAe airfield at Hatfield and RAF Cranwell were substituted. At Cranwell the RAF had made the North Airfield available for two days, and the 24 hours following arrival were to



Left: Oldest participant in the dHMC rally, BAe's DH60 Cirrus Moth, was built at Stag Lane in 1925. Seen here at Henlow, G-EBLV took the prize for the timed circuit from Cranwell on 12 July.



Below left: Starting up — DH82A Tiger Moth, G-AGYU, was flown at the rally by Andrew Wood. The aircraft carries its original military markings and serial, DE208.

the tail lifting almost immediately and eagerly took to the air. A 280° left-hand climbing turn put us on course for the first turning point, and from there on we were fully occupied in answering the questionnaire and making the frequent course corrections necessitated by a 20kt southwesterly wind. A stately 80kts at 1,500ft in a Jackaroo is joy indeed, and as the East Midlands rolled slowly by the sheer exhilaration of flying in a Tiger Moth, albeit a converted one, more than compensated for the minor inconveniences of noise, vibration, and gradually advancing paralysis of the lower limbs! All too soon Grantham came into view, and as we altered course for the final leg to Cranwell we passed over the six military Tigers parked on the grass of the former RAF station where six similar aircraft had landed almost 50 years earlier. The crews were not in evidence, being otherwise engaged in the Officers' Mess where they were enjoying a champagne reception in company with the CO, Col John Riggall, and the Mayor and Mayoress of Grantham.

Leaving Grantham behind we started descending to join the Cranwell North circuit and, passing over the deserted expanse of Cranwell South en route, turned left on finals for a landing on runway 25. Taxying in towards the parking area we could see that in addition to those aircraft which had preceded us from Henlow, several others had operated into Cranwell direct to join in the celebrations.

The parking area rapidly filled as new arrivals swelled the ranks, and the marshallers and refuelling team were kept fully occupied guiding aircraft into line and replenishing tanks in readiness for the next day's flying. The celebrations were to continue with a Grand Banquet in College Hall, but meanwhile there was much to be done; covers had to be fitted and the aircraft, already parked nose to wind, had to be securely picketed in anticipation of a 15-20kt wind forecast for the night. In deference to their age and fragility the three DH60 Moths received preferential treatment and were accommodated overnight in the flying club hangar.

The following morning dawned fair, promising another fine day, and the prospect of further vintage DH flying was

be devoted to further celebration of the Tiger Moth, both in the air and on the ground, in company with the RAF College Flying Club. However, the most meticulous planning can go awry, and just two weeks before the event BAe had to advise that due to industrial action it would not now be possible to stage the event from Hatfield; fortunately RAF Henlow stepped in and offered to host the departure, and a potential disaster was averted.

Thus it was Henlow on which vintage DH biplanes, mainly but not exclusively Tiger Moths, converged during the morning of 11 July. An initial trickle grew to a flood and by 14.00hr no less than 30 examples, ranging from DH60 Cirrus Moth, G-EBLV, to DH89A Dragon Rapide, G-AGSH were lined up, refuelled and ready for the 'off'. The stars of the event were of course the Tiger Moths, and these were present in splendid profusion, sporting a varied selection of civil and military colour schemes typical of most periods in the type's long career.

The flight to Cranwell was to follow a four-leg track, routing Henlow-Little Staughton-North Luffenham-Grantham-Cranwell, with a navigational questionnaire to be completed en route. While most aircraft would simply overfly the former RAF Grantham, permission had been given for six military-marked

Tiger Moths to land before continuing on the final leg to Cranwell. At 15.00hr the selected six cleared Henlow and headed north, led by the RAF College Flying Club's own Tiger Moth G-ANEF (T5493), flown by George Shields, the Club's CFI.

Following the departure of the six military Tiger Moths for Grantham, the remainder took off at two minute intervals, led by Dr Helena Hamilton in her immaculate DH87B Hornet Moth, G-AHBL. I had been offered (and had readily accepted) a seat in Jackaroo G-APAM, flown by Tim Williams, and our mid-position in the departure schedule afforded time for further scrutiny of the route on the 'nav' chart as the lower numbers started up and taxied out to the end of runway 28 for take-off. As our turn approached we mounted the wing walkways and carefully manoeuvred ourselves into the cramped cockpit, impatient to join the growing DH cavalcade on the journey north to Cranwell.

Having strapped in and closed the canopy, a few swings of the propeller brought the engine to life, filling the cockpit with the rich sound which was to assault our ears for the next 1½hr. After running-up, the chocks were pulled aside and 'Alpha Mike' taxied out across the grass to line up into wind at the end of the runway. With a healthy snarl from the Gipsy Major the Jackaroo surged forward,

De Havilland Moth Club Rally — Henlow & Cranwell 11-12 July

Award	Winner	Pilot
Concours d'Elegance	Tiger Moth, G-ARAZ	Ian Hoolahan
En route navigation	Gipsy Moth, G-ATBL	Mike Vaisey
Timed navigation contest	Cirrus Moth, G-EBLV	George Aird
David Jackson Trophy	(1) G-ANFM	John Adams
(Tiger Moth aerobatic contest)	(2) G-ARTL	Steve Marples
	(3) G-AIRK	Richard Teverson
Oldest Tiger Moth participating	G-ACDJ*	Fred Terry
Outstanding contribution to the rally	Jackaroo, G-APAM	Tim Williams
Spirit of the event	Jackaroo, G-AOIR†	Maurice Brett
	F-BGCS	Serge Maigrot (see text)
	G-ANDM	Geoffrey Green and Peter Benest‡

* C of A issued 29 March 1933.

† For acting as transports, camera-ships etc.

‡ Both men are airline captains flying B747s for Cathay Pacific and British Airways respectively. Arriving independently in the UK from Hong Kong and Bombay in the early morning of 11 July, by 13.00hr they and their Tiger Moths were at Henlow for the rally.

enough to banish any effects of possible over-indulgence the night before! By 10.00hr the airfield was alive again as covers were removed and stowed, picketing lines untied, and engines run up. A timed navigation contest was to be staged

Below: It helps to be able-bodied when moving Moths on the ground! Nigel Reid and Malcolm Ward manhandle DH60G Gipsy Moth, G-AAWO, to the flying club hangar at Cranwell.

Bottom: Tiger Moth, G-AJHU, takes on fuel at Cranwell; the smoke is from another aircraft starting up.

before lunch over the route Cranwell-Grantham-Tollerton-Cranwell; the participants had to estimate their time to complete the course, from wheels off to returning overhead the Cranwell North signal square, and try to match the predicted time as closely as possible while not deviating from the route.

Departures on the timed circuit were spread over an hour, leaving ample time for local flying with no particular end in mind except pure self-indulgence and the occasional photo-call. I had been recruited to accompany Maurice Brett in Jackaroo, G-AOIR, in order to formate with and

photograph Tiger Moths G-AJOA and G-ACDJ and Jackaroo G-APAM, the three having flown up to Henlow together the previous day from their home base at Siege Cross Farm, Thatcham. After suitable planning and briefing we took-off and flew a left-hand circuit while the three aircraft formed on the camera-ship; considerable up-draughts meant that for safety reasons only a fairly loose formation could be held, and as we approached Cranwell North we banked slowly away to port and passed to the south of the airfield and in front of the stately facade of College Hall. A second circuit and pass ensured that all the required shots were obtained, and we rejoined the landing pattern to return to earth for lunch.

During the afternoon the airfield was closed to arrivals and departures while a succession of nine members demonstrated their aerobatic prowess in a competition for the dHMC's David Jackson Trophy. The competition sequence, set by Barry Tempest, consisted of: 1) roll off the top, 2) one turn erect spin, 3) half reverse Cuban, 4) slow roll, 5) half Cuban, 6) barrel roll, 7) stall turn, 8) loop. The Tiger Moth is a far from ideal aerobatic aeroplane, aileron response in particular leaving much to be desired, but nonetheless we were treated to a most impressive display by the competitors and the judges' task was by no means an easy one.

With the aerobatic competition over, it was time for the presentation of prizes and the journey home. The Tiger Moth's 50th anniversary had been celebrated in the most appropriate way possible, but as the participants dispersed and Cranwell North returned to normality the reason for the immense popularity of this spartan and far from perfect aeroplane remained a mystery. It is of course true that initially the Tiger Moth arrived at the right moment in history, that the 1939-45 war caused vast numbers to be built, and that as a result the type was available in the right numbers and at the right price when private aviation became re-established postwar; but that does not explain why it should enjoy such widespread popularity and acclaim today.

Serge Maigrot and his Tiger Moth, F-BGCS, started out from Reims on 8 July, intending to spend several days in England before taking part in the rally. Dogged by bad weather in France, they suffered repeated delays and were finally able to leave Le Touquet on the morning of 12 July, arriving at Cranwell at 14.00hr. If the appeal of the Tiger Moth had not been explained, it had at least been demonstrated.

Right: A line-up of two Tiger Moths and two Jackeroos at Cranwell North, headed by Richard Teverson's DH82A, G-AIRK.

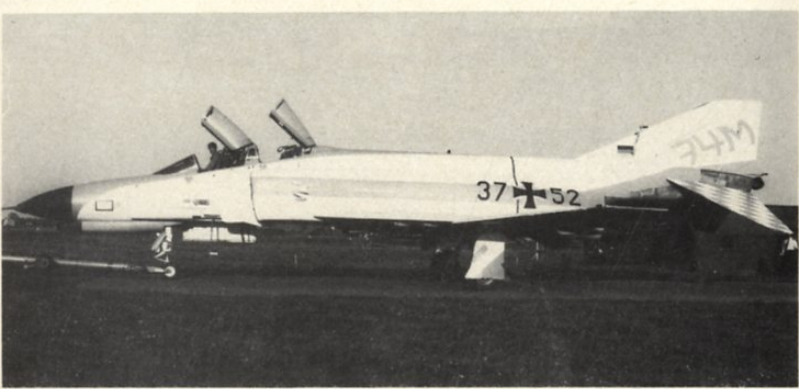
AIRCRAFT ILLUSTRATED





Festive Phantom and.....

To commemorate the 20th anniversary of the formation of *Jagdgeschwader 74 'Molders'* (JG74), WGAf, one of the unit's Phantom F-4Fs, 37+52, was specially decorated in a striking blue and white paint scheme. The aircraft was also adorned with the underwing lettering *20 Jahre JG74M* (20 Years JG74M), which was revealed during a flypast in celebration ceremonies held at the unit's base at Neuburg on 9 May 1981 (as seen above). The pattern applied to the aircraft's upper surfaces is displayed (right), in this port-side view of 37+52; note the chequered tailplane. *Photos: Michael Riedesser*

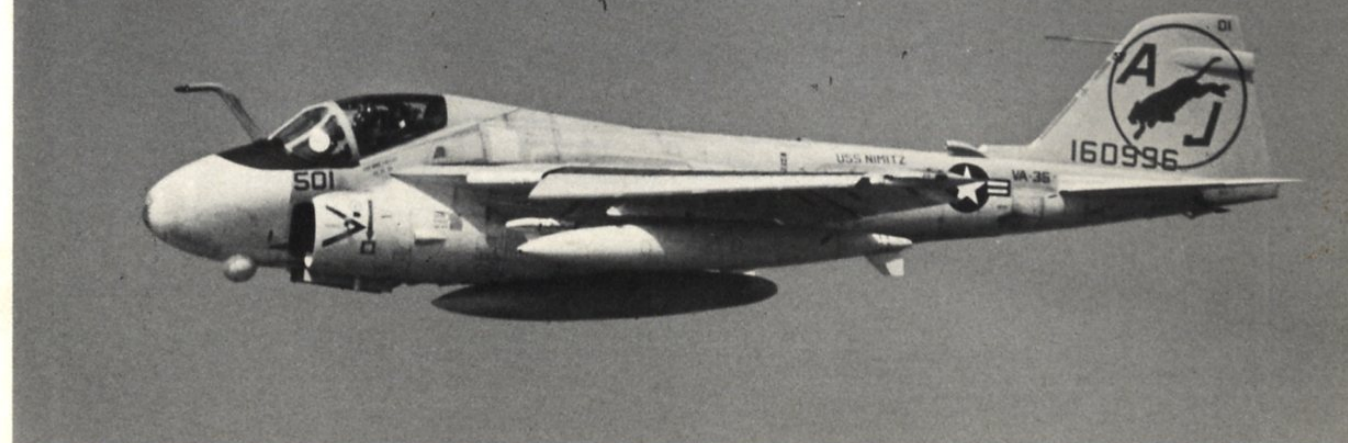


....Pferdsfeld visitors

Turkish AF Phantoms are a very rare sight in Northwest Europe, but four F-4Es of No 111 Squadron from 1st Air Base, Eskisehir, visited the WGAf base at Pferdsfeld in early July; an example of which, 1-299, is seen (right). The identification number on the nose intake features the last three digits of its serial — in this case 67-0299. The visit by the Turkish F-4Es was part of a squadron exchange exercise with *JBG35*, who fly F-4Fs. *Photo: Michael Riedesser*



'PHOTO DERBY 81'



Report by Don Linn

The Photo Derby is a competitive photo reconnaissance competition that was first contested at NAF Washington, DC in April 1980. The 1981 exercise, 'The Second Annual World Famous Open Class Photo Derby', was held between 12-18 April and brought together 16 units, either participants or support elements.

The purpose of the Photo Derby is to promote the role of tactical reconnaissance as it applies to today's military environment and also to bring together aircrews from different services to allow for an exchange of technique and ideas.

Below: Canadian Forces CF-5A, 116725, of the 434th Tactical Fighter Squadron was the highest scoring aircraft on the last day of 'Photo Derby 81'; the aircraft was flown by Col Williams.

Photo: Don Linn

The majority of aircraft participating in the competition were RF-4C Phantoms, but other types included the RF-8, CF-5, A-6E TRAM (Target Recognition Attack Multisensor) Intruder, and the new F-14 TARPS (Tactical Airborne Reconnaissance Pod System). Each competing aircrew flew one sortie per day to targets within a 300nm radius of NAF Washington. Points were awarded for target acquisition, film useage, coverage and time over target. Grumman E-2Bs acted as airborne co-ordinators and also provided control of intercepts by 'aggressor' (TA-4J Skyhawk) aircraft.

At the end of the competition, an F-14 Tomcat with the TARPS emerged as the highest scoring aircraft. The award for the best team was presented to Sqn Ldr Jack Stirrup, RAF (on an exchange posting), for the RF-4C Phantom team, of the 67th TRW from Bergstrom AFB, Tx. (A further report on the 'Photo Derby 81' will appear in *Armed Forces* magazine, on sale 12 October).

Above: One of the A-6E TRAM Intruder participants in the Photo Derby was BuAer 160996 from VA-35, USS Nimitz. This particular aircraft suffered a severe bird strike to the left canopy section on the last day of the competition, forcing the injured pilot to make an emergency landing at a civilian airfield.

Photo: Don Linn

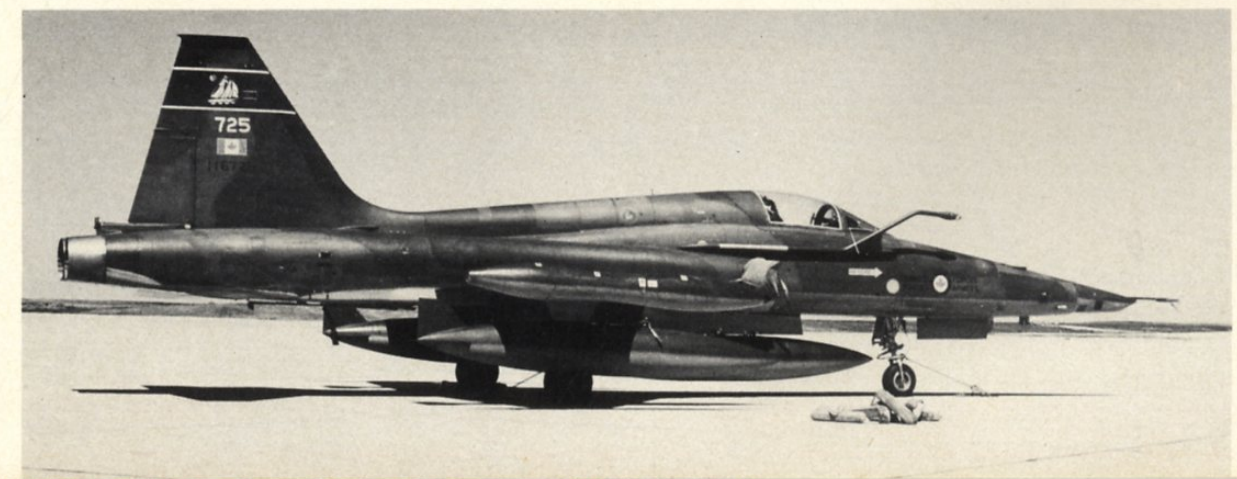
Colour centrespread, overleaf

Top: US Navy RF-8G Crusader, BuAer 145622, taking on fuel from KA-3B tanker, BuAer 142664 of VAK-308, during 'Photo Derby 81'. The Crusader belongs to VFP-63 based at NAS Miramar, Ca; the last remaining active duty RF-8 squadron in the US Navy.

Photo: Don Sperling/AIR

Bottom: The individual winner of 'Photo Derby 81' was the new F-14 TARPS (Tactical Airborne Reconnaissance Pod System), BuAer 160914, from VF-124. Visible in this view, TARPS is a camera pod installed on the No 5 Phoenix missile station and the unit contains two camera systems and infrared systems.

Photo: Don Linn



'Photo Derby 81'





Report by **Cambridge
Aviation Photographers**

Giant Strike XI

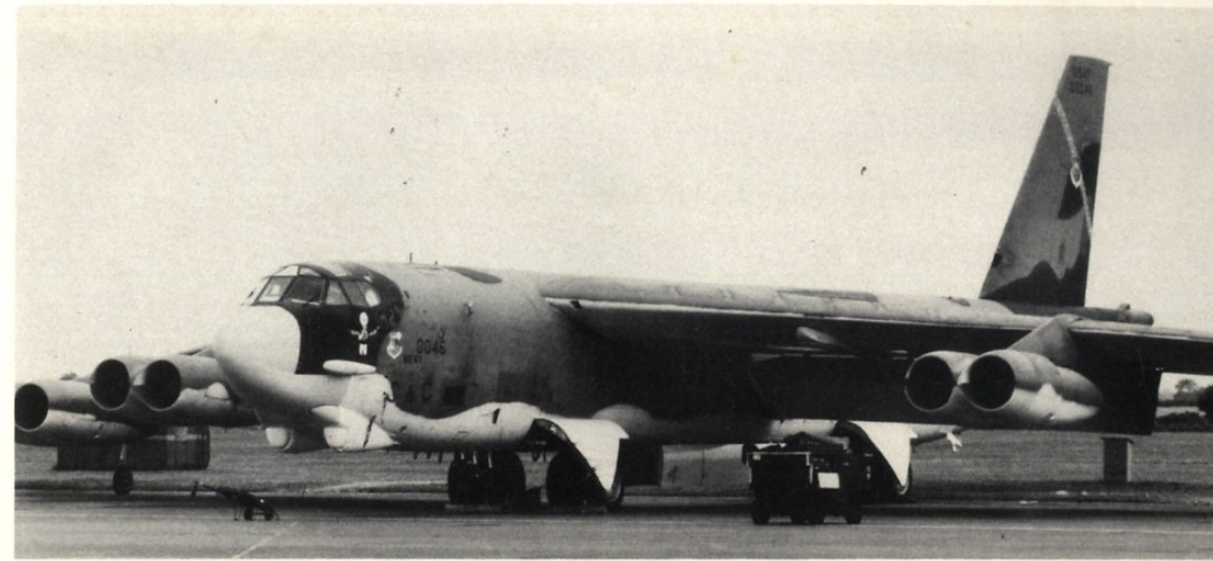
THE USAF Strategic Air Command (SAC) sent five Boeing B-52s to RAF Marham to compete in the bombing section of this year's RAF Bombing and Navigation Competition — Exercise 'Double Top 81'.

The deployment, termed Giant Strike XI, involved three different Bombardment Wings (BW), all flying the B-52H variant. The aircraft came from the 5th BW, Minot AFB, ND (s/n 60-0046); the 319th BW, Grand Forks AFB, ND (61-0022 and 60-0026); and the 410th BW, K. I. Sawyer AFB, MI (61-0028 and 60-0057). The 5th BW and the 319th BW come under the control of the 57th Air Division, 15th AF while the 410th BW operates within the 40th Air Division, 8th AF.

There were two trophies for which the SAC aircrews competed, the Camrose Trophy awarded to the best RAF or USAF team (a team consists of three aircrews), and the Blue Steel Trophy awarded to the air force with the best individual crew in bombing in Phase II; Phase I of 'Double Top 81' is an RAF competition among the six Vulcan squadrons. Finalists

Top: Boeing B-52H, 61-0022, of the 319th BW comes in to land at RAF Marham during the 1981 RAF Bombing and Navigation Competition. On the fin the aircraft carried...

Right:... a cartoon of the Bugs Bunny character, 'Yosemite Sam' with the legend 'Red River Raiders'.



from that section then proceeded to Phase II where they competed against the four SAC B-52 aircrews (the other crew forming the team reserve).

Competition sorties were flown during the week starting 6 July, each mission having three simulated low level bomb

releases at target ranges within the UK. In the event, RAF Vulcans of No 44 and No 617 Squadrons swept the board, winning all the major awards including both the Camrose and Blue Steel trophies (see 'airnews' item, Sep 81, p390 — Ed). Although on this occasion the USAF

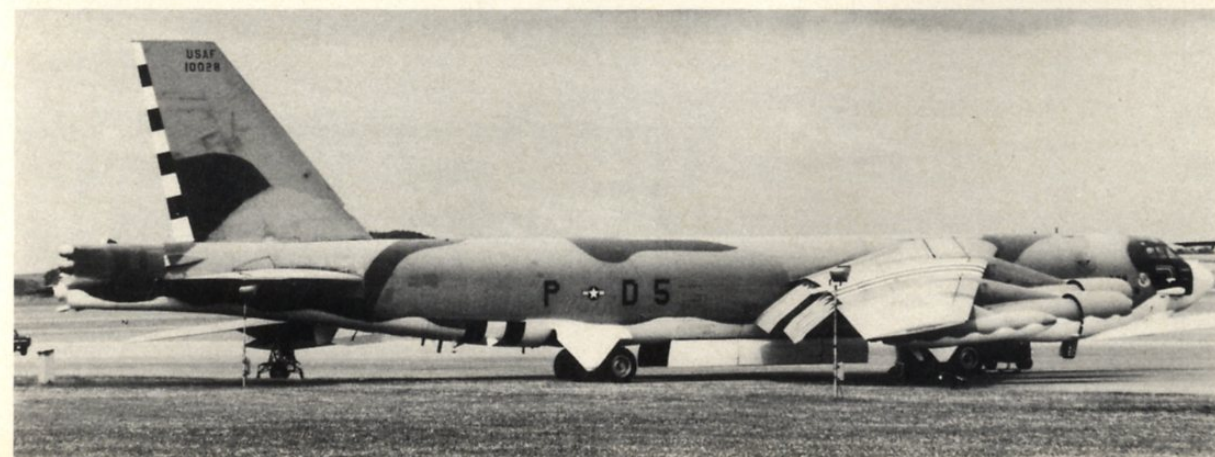
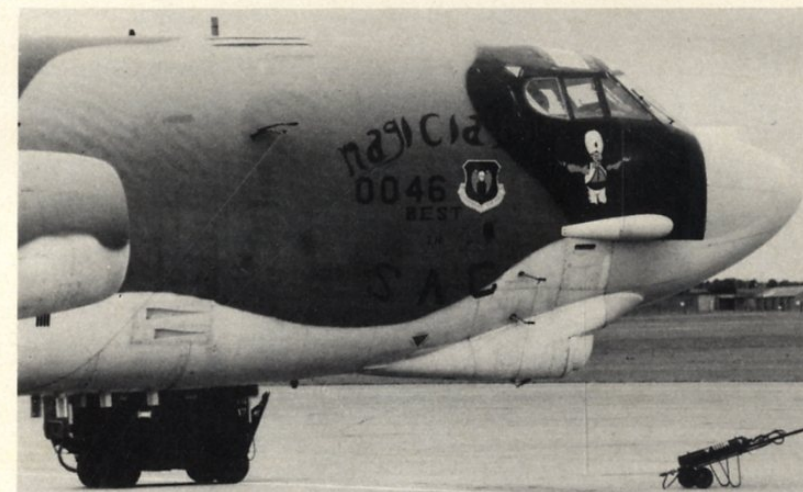
crews lost out to the RAF, the presence of the US visitors was, as always, a welcome addition to the competition. Almost inevitably, several of the B-52s were branded with distinctive artwork — some of which can be seen in the accompanying selection of photographs.

Above: Port-side view of B-52H 60-0046, of the 23rd BS, 5th BW, based at Minot AFB, ND.

Right: Nose details of 60-0046, dubbed 'Magicians', 'Best in SAC' which features the 5th BW badge and a small Magician.

Below: Coded PD-5 and with black & white stripes on rudder, underfuselage and wings was 61-0028 *Someplace Special*. Identical marks were carried by B-52, 60-0057 (with the exception of the code, C-5D); both aircraft are from the 644th BS, 410th BW, based at K. I. Sawyer AFB, MI.

All photos: Cambridge Aviation Photographers





Chalk's amphibious airliners

Alan Wright

ALTHOUGH BRITAIN is surrounded by water and traditionally regarded as a seafaring nation, only a handful of aircraft in the UK are equipped for the occasional paddle. A few small privately owned amphibians 'potter' about, but certainly nothing resembling an airliner is to be

found in service. To sample such mode of transportation it is necessary to travel far, one convenient location being Miami, Fl. Convenient because this State is of course well known for its aeronautical delicacies, the Mallards of Chalk's International Airline adding their contribution to the feast available.

Chalk's base is located on Watson Island, which is connected by the MacArthur Causeway to the City of Miami and the southern end of Miami Beach. Originally known as Chalk's Flying Service — the present name was adopted in the early-1970s — the company in fact

Above: Mallard, N2442H, taxis down the slipway and enters the water at Watson Island, Miami. The aircraft is not in the standard Chalk's livery, but still wears the red/black speedline of Antilles Air Boats from which it is leased; since the latter company has ceased operations it seems likely that the Mallard will remain in Miami.

All photos by the author unless otherwise credited

proudly claims to be the world's oldest airline, having been formed in 1919 by Arthur B. Chalk. He was one of the US's early aviators, gaining his pilot's licence in 1911 at the controls of a French Banoist flying boat. His airline flew its first operation in July 1919 using a Curtiss HS-2L seaplane for the trip between Miami and the island of Bimini.

The present day single-storey terminal building on Watson Island is small but contains all the necessary facilities. Check in was swiftly completed in a friendly and informal manner after which complimentary coffee was available during the short wait for the flight to be called. When the imminent departure was announced, this too contained a novel variation to the standard chant over the public address. At Chalk's, passengers are requested to board a specific aircraft as identified by its registration!

It was a short walk to the waiting aircraft, N3010, but there was still time to take in the impressive backcloth to the scene. Not far away across the water the

Left: A colourful scene at Miami as Chalk's International Mallard, N73556, comes ashore at the airline's base on Watson Island. Photo: Piers Heron



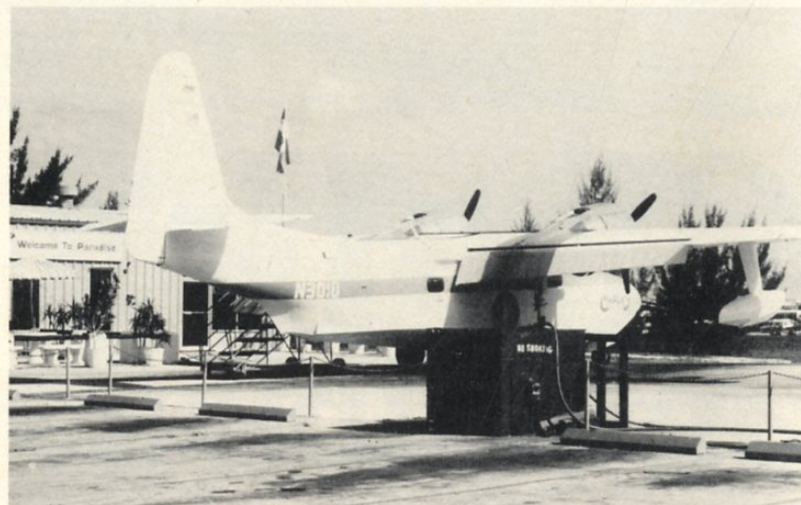
Above: On its take-off run from Miami, Mallard N2970 has just ceased to rely on its starboard float for stability.

Right: Chalk's International Mallard, N3010, at the company's terminal on Paradise Island, Nassau.

skyscrapers of Miami stood out in the sunlight, while opposite Chalk's base it is quite normal to find several large cruise liners berthed awaiting their next batch of passengers for a Caribbean extravaganza.

The Mallards share a long straight but quite narrow channel with the ships, the wakes from which sometimes cause a few pitching problems for the aircraft during the take-off run. To reduce this effect, the aircraft's baggage load is distributed between the nose and rear fuselage holds. The weights are carefully calculated and adjusted each time a variation in passenger numbers is received. The object is to achieve a fore and aft balance which lessens the pitching in disturbed water, gyrations which can otherwise prove uncomfortable. It is then that travel pills and potions are tested to the full. Not all brands appreciate it is possible to be seasick in an aircraft!

The entrance door of the Mallard is located fairly high on the port side towards the rear of the fuselage and, having negotiated the opening, it is then necessary to step down to the cabin floor and aisle. On the left hand side four single seats are located, while four sets of doubles plus one single on the right complete the seating arrangements. The last mentioned is



situated alongside the centre bulkhead which effectively divides the cabin and is thus the only position lacking an exclusive window. The Mallards are smartly turned out in a basically blue decor internally with beige roof and upper wall panels. This matches the overall white with blue cheatline and engine cowlings now adopted as Chalk's standard external livery.

The usual safety talk was carried out by the first officer (in the absence of a cabin attendant) before he settled into his right hand seat. Start up followed almost immediately, which quickly made it apparent that the Mallard, with its two 600hp Pratt & Whitney Wasp R-1340-S3H1 engines, is not the quietest of aircraft, even at the rear of the cabin. Plans are in hand to convert the entire fleet

to turboprop power, the first two being dispatched to the contractor in Texas some time ago. Chalk's was scheduled to have this pair in service during the summer, the benefits to be derived being a much reduced noise level in the cabin, an increase in speed and a welcome reduction in operating costs. However, in the interim any slight discomfort was soon forgotten as the amphibian began to taxi the short distance to the steeply sloping slipway. As soon as the bulk of the aircraft was in the water, it paused for a moment as care is needed during the final transition to avoid damage to the rear hull as the nose begins to lift. Once fully afloat the wheels were retracted while the Mallard moved out into the centre of the channel for take-off. It largely depends on the water state exactly how soon and at which point this is

started, wind direction of course also playing a part.

Immediately the engines were opened up, the rear fuselage settled in deeper; the view from the aft cabin becoming completely obscured by the rushing spray. The forward windows soon became immune

from the effects as the nose came up and the aircraft got on to the step. The wing float could be seen racing across the surface, while the bangs and thuds from underneath the hull as it carved its way through the small waves gradually reduced until after a fairly long run, the Mallard shook itself free. When taking off in an easterly direction there is little course correction necessary since the Bahamas lay almost dead ahead. Slowly but surely the aircraft climbed up to its cruising height of 5,500ft, settling for a speed of 120mph for the 1½ hr trip to Nassau. The ever changing colours of the sea made a magnificent sight for the passengers, especially when the shallows surrounding the many small islands were passed.

Within the cabin air circulation is achieved by a simple but effective method. Instead of the familiar adjustable nozzles above the seats, two six inch electric fans are mounted on each of the forward and centre bulkheads facing aft. The crew is also provided with one each, these being fitted on the roof of the flight deck. The

latter is very compact with all instruments and controls within easy reach of either pilot which removes the need for duplication. The view through the small panels of the windscreen is quite good considering the long nose of the Mallard.

After a smooth and uneventful flight the descent was started as the island was approached. Chalk's base is situated on Paradise Island separated from Nassau by a stretch of water some 400yds wide. Connecting the two is a toll bridge and a variety of small ferries. To avoid this activity, the Mallards splash down some distance from the slipway, the ensuing taxi at speedboat speed proving an interesting experience. The wheels were extended just before the aircraft climbed from the water to stand dripping beside the small terminal building appropriately labelled 'Welcome to Paradise'. Already occupying space on the apron was a locally registered Mallard, C6-BDW, and an American Goose, N86640, but there was still ample room for the Chalk's machine to manoeuvre and park.

One of the airline's slogans is 'we fly from downtown Miami to downtown Nassau' and this is very true since neither end involves much travelling to the centre of activity. The fare between the two cities is the same irrespective of carrier, so it is possible to fly one way by Mallard and return on board such types as a Boeing 737, DC-9, DC-10 or Airbus. To do this it is necessary to use a taxi to reach Nassau International airport since there is no bus service provided for the 20min journey. The decision may well be regretted as the cars are driven with complete disregard for other vehicles, cycles, pedestrians or the 35mph speed limit! However on this occasion the Mallards were the major attraction, so Chalk's service was used for the return trip, which by chance employed the same aircraft and crew as on the outward leg.

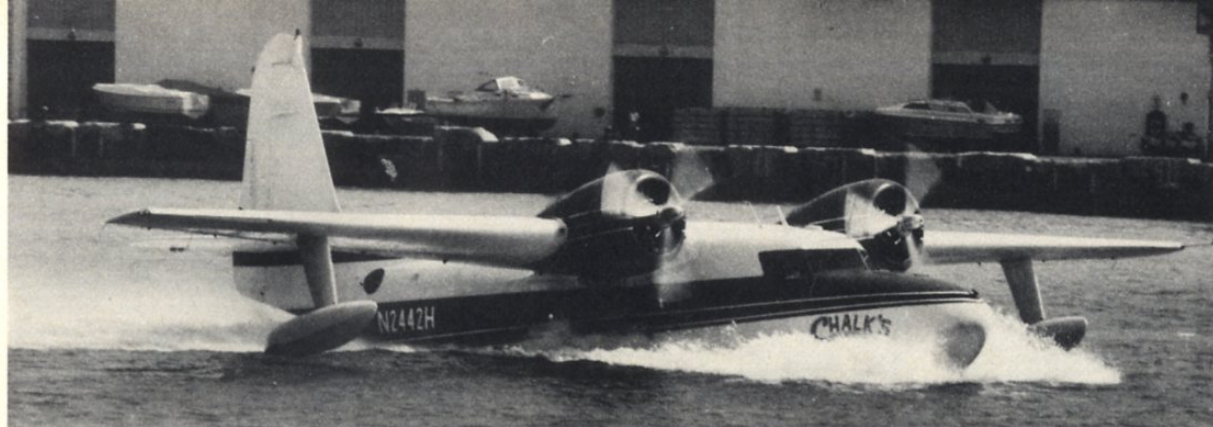
Once more with the minimum of fuss the aircraft was loaded and soon in the water. This time a lengthy taxi was necessary to allow take-off to begin beyond the bridge rather than to become airborne and actually fly under it. Operation approvals limit the Mallards to VFR day flights only and somewhat surprisingly the crews do not report progress or obtain clearances by radio from the nearby major control centres. It nevertheless creates no problems as borne out by the airline's excellent safety record.

Back at Miami, the Mallard rejoined three of its companions on the apron, the fifth machine night stopping at Nassau. Ground staff were quickly in evidence with hoses to wash the aircraft down, a procedure carried out at regular intervals during the day. Corrosion is obviously a problem with this type of operation,

Below: Only two Mallards have ever appeared on the UK register, this example seen awaiting its passengers at Miami, being one. After service in Canada, it became G-ASCS in 1962 — returning to Canada seven years later. It is now with Chalk's as N73556.

Bottom: The Chalk's amphibians are dwarfed by the shipping (in this case a fairly small container vessel) with which they share the Miami channel.





Above: The Mallard sits quite low in the water when being taxied fairly slowly. For longer distances the aircraft are usually taken on to the step for faster and smoother movement through the water.

Below: The G-111 Albatross will eventually replace the Mallard on Chalk's services as loads demand a larger machine. N112FB is seen during test flying with Grumman and is destined to join Chalk's fleet.

Photo: Grumman Aerospace

amphibians being particularly susceptible since it is virtually impossible to seal the undercarriage apertures. Drainage holes are provided and small bilge pumps remove the unwelcome water which is forced into the hull.

Chalk's activities are essentially to interconnect the islands of Bimini, Cat Cay and Nassau with Miami using daily scheduled services. However charters are regularly flown, particularly in the Bahamas. At one time traffic figures reflected the seasons, but nowadays there is little change throughout the year, load factors averaging 90% per flight. Weekends are especially busy, services invariably being fully booked two weeks in advance. Originally tourists made up the majority of the total passengers, but in recent times an increasing number of local people have joined the visitors. It was this volume of business that prompted the airline to seek expansion with aircraft of greater capacity.

The type selected was the G-64 Albatross, an amphibian built by

Grumman between 1948 and 1961 for use on search and rescue duties and known to the military as the SA-16 — later changing to HU-16. Both Grumman and Resorts International, the parent company of Chalk's, bought in a number of machines from among the 200 plus still surviving in anticipation of a civil conversion. Identified as the G-111, development of the commuter version has proceeded, incorporating the necessary changes to meet FAA requirements. The redesign has been the responsibility of Resorts International who received type certification for the Albatross in April 1980. Grumman is actually carrying out the conversions but will be paying royalties to the designers for any sold by its own sales team.

The aircraft involved in the project have been found to be in excellent condition despite the nature of their duties around the world. Nevertheless they have been completely stripped down for a thorough check for possible corrosion. Any doubtful areas have been renewed as a precaution, while the wing centre section has been remanufactured using titanium instead of the original aluminium. Modern anti-corrosion treatments have been applied as the work continued. Complete rewiring of the electrics has been included in the programme, while at the same time new avionics systems have been installed with weather radar replacing that originally fitted in the nose radome.

Much of this work could equally be applied to Albatrosses destined for a further career in military service. To bring the type to civilian standards, additional modifications were necessary. Fire proofing and fire detection equipment has

been fitted, while the number of emergency exits has been increased in the cabin. On the existing airframe, doors opened inwards which contravenes safety rules for airliners and accordingly they have been modified to open outwards. The interior can accommodate 28 seats in a mix of doubles and singles, the latter being positioned adjacent to the centre section and main wheel housing. Provision has also been made for a flight attendant's position and a toilet, both new features on Chalk's aircraft. As each machine comes off the line on completion, it can be considered almost brand new. Initially Grumman carried out the conversion at its Stuart, Fl facility, but after late-1980 all work on the G-111 was transferred to a newly reopened centre at St Augustine, Fl. Here it is expected that six aircraft will be completed per year, but if the demand warrants it, this figure could easily be doubled.

The first Albatross is due to enter regular service with Chalk's on 1 October 1981 after its test flying and sales tours have been concluded. The airline will initially receive two, but in due course five will be on strength. There are no immediate plans for the type to replace the Mallard, but merely to supplement it on the existing route network. However this will be expanded to include Fort Lauderdale International as a terminal for new services to be flown with the Albatross. Alterations are in hand at Watson Island to reduce the slope of the slipway and increase the area of hard standing prior to the introduction of the larger type. Not only will handling problems be greatly reduced, but the continued existence of the Miami base is ensured.

Already studies have been made into the feasibility of replacing the present Wright R-1820-82 engines with turboprops. It is almost certain to be approved, although no firm decision has been taken as to which engine will be selected. When this conversion is completed in the future, it is possible that the Mallards will be gradually phased out, although with their own recent change of powerplant they should be good for some years' service before that day arrives.

AIRCRAFT ILLUSTRATED



VOLANT RODEO



John J. Metzler

THE ANNUAL 'Volant Rodeo' military manoeuvre held at Pope AFB, NC between 7-13 June tested the tactical airlift skills of American and Allied forces. The competition brought together aircrews from the USAF Military Airlift Command (MAC) as well as Allied crews from the RAF, Italian AF, Canadian Forces and the RAAF, in a bid to find, according to MAC, the 'best of the best' of tactical airlifters.

Recognising the need for rapid and effective tactical airlift capability in today's conflict-prone international scene, 'Volant

Rodeo' is designed to keep MAC and Allied crews up to standard in such critical areas as aircraft maintenance, STOL, field landings, airdrop, and military police procedures. Crews were rated on their performance during the two week event in June.

For the past three years, 'Volant Rodeo' has been conducted at Pope AFB, as this base conveniently adjoins the massive US Army Ft Bragg reservation. Since about 85% of MAC's Joint Airborne/Air Transportability Training transpires at Pope AFB, it is only realistic that the USAF Airlift Center is located there. Likewise, being home of the 82nd Airborne Division, Special Forces, and the 18th Airborne Corps, Ft Bragg/Pope AFB

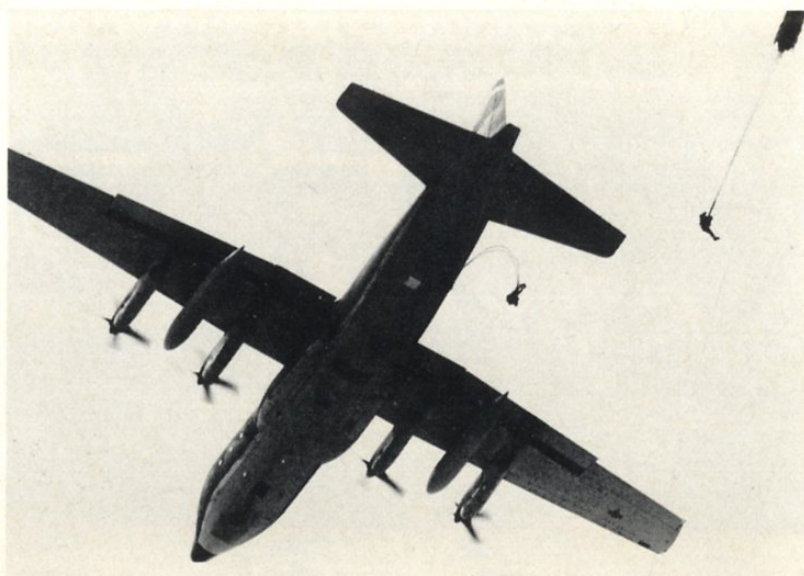
Above: Aircraft participating in the 1981 Military Airlift Command (MAC) tactical airdrop competition lined up on the 'Green Ramp' at Pope AFB. Participants in 'Volant Rodeo' included C-7 Caribou, C-123 Provider, C-130 Hercules and C-141 Starlifters. Photo: USAF

remains unique in the nation. During times of world tension, forces stationed at this location would be among the first to be placed on alert. Naturally such units would

rely on the MAC infrastructure to provide an airbridge to their destinations.

MAC's 314th Tactical Airlift Wing (TAW) from Little Rock, Ar, took the honours of 'Best Overall Wing' while the 438th Military Airlift Wing (MAW) from McGuire AFB, earned the 'Best C-141 Aircrew' ratings. The 317th TAW from Pope AFB, NC gained the title of 'Best Combat Controllers'.

Allied participants found themselves in the thick of the competition too. The 'Best Allied Team' award went to the RAF Lyneham team from the UK (flying C-130 Hercules), with Canada a close second place. The UK forces also topped overall scores for Security Police and 'Best C-130 Engine Running Offload'. Aircrew from No 47 Squadron finished third overall from among 19 C-130 teams in both the aircrew and short field operations categories. Other UK results were: Hercules Maintenance Teams, third; Best Overall Wing, eighth from a field of 30.



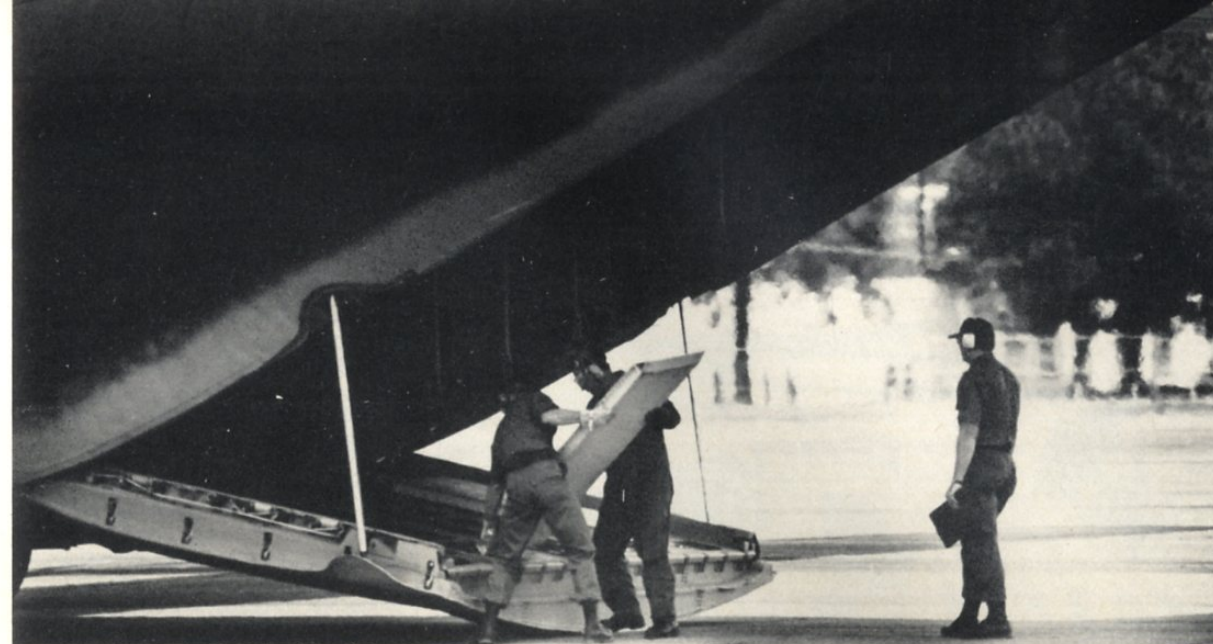
Top: US Army paratroopers exit from a C-130 during the personnel airdrop phase of 'Volant Rodeo'. Aircrews earned points for a variety of events including heavy equipment, container delivery system airdrops and tactical assault landings...

Above: ... the latter demonstrated here by the RAF Lyneham team in Hercules, XV218. The spectacular short-field landings were carried out at the Fort Bragg Falcon landing zone. Photos: USAF and Crown Copyright, RAF Lyneham

Left: A member of No 47 Air Despatch Squadron, Royal Corps of Transport (RCT) supervises the loading of the RAF C-130 in preparation for...

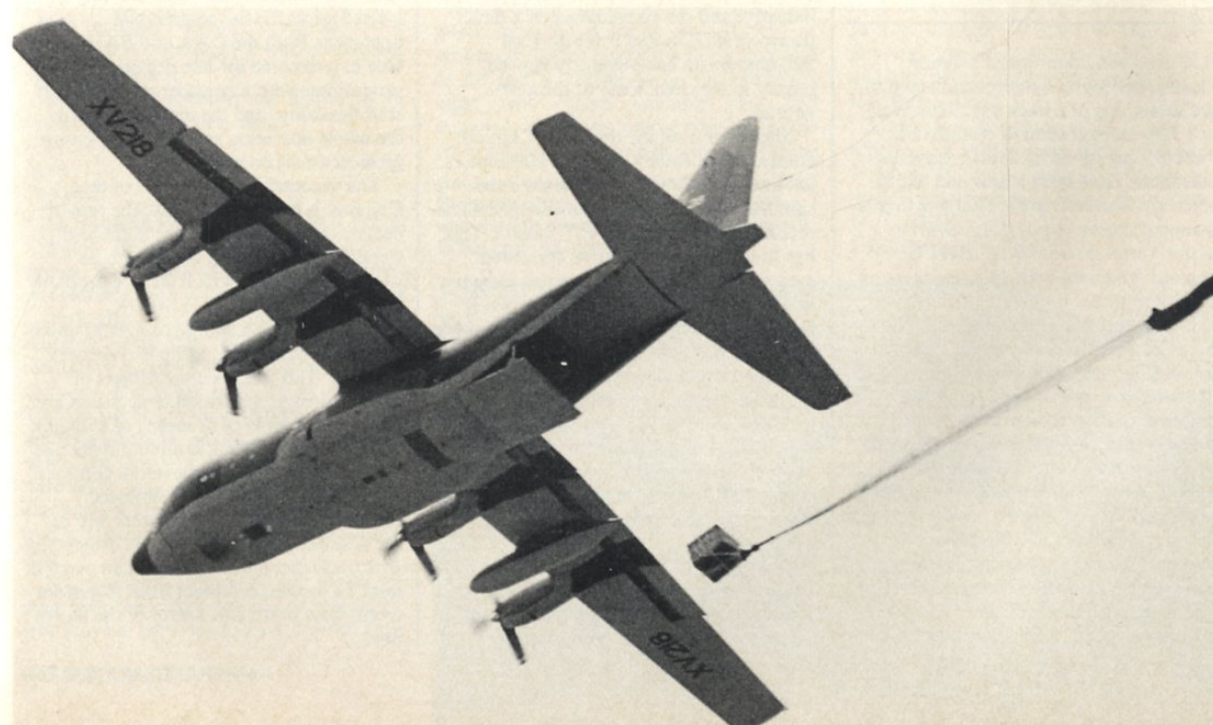
Right: ... the airdropping part of the competition. RAF Hercules C1, XV218, discharges its load over North Carolina during 'Volant Rodeo'. Photos: Crown Copyright, RAF Lyneham

AIRCRAFT ILLUSTRATED



Above: A loading ramp is attached to a C-130 as part of the engine running onload and offload phase of the competition. The UK forces won the award for the 'Best C-130 Engine Running Offload'. Photo: USAF

Left: At the conclusion of 'Volant Rodeo 81', US Maj Gen Thomas M. Ryan Jr inspects the RAF detachment. Photo: Crown Copyright, RAF Lyneham



Commercial Chinook



enters service

James D. Ferguson

IN A fixed-wing dominated aviation industry, helicopter achievements tend to take something of a back seat. However, the 1 July inauguration of commercial Chinook operations by British Airways Helicopters (BAH) set a new and highly significant standard in the vital North Sea oil-support scene. At 07.15hr, BAH's Boeing Vertol BV234LR, G-BWFC, departed Aberdeen with 44 passengers on the 260nm sector to Shell Expro's Brent field. Two hours later the aircraft landed on one of the complex's helidecks, and after visiting other platforms it returned to Aberdeen in a little under 2½hr. The complete rotation took exactly the scheduled five hours, this comparing with the six-nine hours attainable on the previous route via Sumburgh. Although only some 30% of Shell Expro's employees working in the East Shetland Basin are scheduled to use the Chinook, there are already signs that other workers seem dissatisfied with the alternative fixed-wing/helicopter system. Chinook has

undoubtedly set totally new standards of comfort for the oil-support helicopter industry, and the convenience of a direct transportation to and from the East Shetland Basin has obviously figured largely in the client's use of the new aircraft.

Shell Expro signed the initial Chinook contract with British Airways Helicopters in November 1978, and while no exact sum has been revealed, industry specialists report a value of around £70 million. This has to be the most lucrative agreement ever signed within the oil-support industry and its seven year duration probably makes it the longest. The contract involves three of BAH's six Chinooks, and in addition to providing helicopter support for the Brent field, personnel transportation will also be carried out to the client's Fulmar field, 150nm to the east of Aberdeen. The latter is still in the construction phase, with the helideck expected to become operational during the autumn.

Two more BAH Chinooks go into service for British Petroleum when the construction phase of its Magnus field begins in August 1982. This massive

Left: Passengers boarding BAH's first commercial BV234 Chinook flight at Aberdeen on 1 July. The aircraft, G-BWFC, flew a 260nm sector to Shell Expro's Brent field.

Photo: James D. Ferguson

complex will lie to the north of the Brent, giving a sector distance of almost 300nm from Aberdeen. Initial BP contract length is 15 months, with an optional extension of six months, and its value is reportedly £9 million. A number of major North Sea oil companies are known to be monitoring the progress of Shell Expro's Chinook experience and other contracts are expected to be signed. Much will necessarily depend on industry reaction to recent oil taxation and depletion policies. This could slow down large-scale production development and hence reduce helicopter requirements, but across the North Sea in Norway a major client is known to be highly enthusiastic to adopt the Chinook as its main support type. A combined client/operator team has been talking to Boeing-Vertol and an order for up to three aircraft is thought to be probable. Deliveries during the latter half of 1982 could be achieved, with the Norwegian authorities utilising much of the material already gained during the FAA/CAA certification programme.

Although the first Chinook flight departed exactly on schedule, late delivery of the test aircraft resulted in considerable disruption of both the training and certification programmes. The bulk of the former was carried out at Prestwick, and BAH was eventually able to provide trained pilots for the commercial operation. Both the CAA and BAH were able to overcome the late delivery programme with a considerable degree of staff flexibility, and the industry regards the whole operation as reflecting the very greatest credit on all involved.

The successful introduction of the Chinook is bound to increase the rate of decline being experienced at Sumburgh airport in Shetland. In addition to its weather problems, which include probably the worst fog statistics in the UK, Sumburgh levies a charge of £28.50 on all oil-related passengers using its Wilsness terminal. This has been the subject of much industry opposition, and clients are known to be looking at means of avoiding this expense. Chinook is undoubtedly one outcome (even though the initial contract was signed long before the financial controversy began), and another will be the AS332L Super Puma — as ordered by Bristow Helicopters — which can carry at least 19 passengers direct from Aberdeen to any part of the UK sector of the North Sea.

airmail

Still up in the air!

Sir,

I was most interested to read the 'airscan' column in the July 1981 issue, especially the section titled 'All up in the air' in which Paul Humphreys discussed air display commentary.

While I wholeheartedly agree that, 'the great majority of the public who attend air shows... want their money's worth', and deserve no less considering the cost of a family excursion to such events, may I temper the issue with a plea on behalf of sound recordists?

I know not how many of this breed attend air shows, indeed I sometimes feel distinctly insular at the blunt end of my microphone-boom. However, many of my recordings evince similarities to Harry Carpenter or Murray Walker trying to compete with ambient noise which inevitably culminates in unintelligibility, aggravated by PA system distortion and reverberation from surrounding hangars and the like.

Therefore, I would respectfully say to commentators, by all means 'rabbit on about wing spans, VNEs, bomb loads and paint jobs', but would they please confine it to the 'quiet' portions of the displays when the aircraft are turning.

To be fair, the July 1979 Hatfield commentator expressed his regard for recordists and restricted his talking to the turns, which I thought most civil; and Bournemouth July 1980 was blessed with a highly intelligible commentator combined with a PA system of optimum output, which actually served to enhance the recordings — although I was up-wind of the loudspeakers!

Otherwise I consider air shows to be superb family entertainment.

IAN A. TURNER

Bath,
Somerset

Paul Humphreys replies: My TAP (Total Aviation Person) commentator mate, to whom I passed Mr Turner's letter, sympathises with sound-recordists as he is a dedicated decibel-hound himself. His problem, and that of all other commentators he supposes, is that often there are very few quiet portions of displays. The Harrier is the most difficult aircraft to describe when its 'on' — all roar, hiss and howl. The length of the crowd line makes a difference, too. At a big airfield with the extreme ends more than a mile apart, one man's silence is another man's 150Pndb roar.

So, commentators, remember please the men with the mikes, the sound-recordists, who have a very specialised need to hear

what you have to say — VNEs, paint jobs *et al* — and confine your rabbiting to moments when there's a hush about.

The cost of a replica

Sir,

I was very surprised at the report that appeared in 'airview' in the March 1981 issue, to the effect that the RAF Museum had paid £40,000 for the Sopwith 1½ Strutter made by Viv Bellamy; especially at the present time when money is short and the museum is begging various bodies and members of the public to dip into their pockets and help pay for the 'Battle of Britain' Museum.

From the TV coverage and other reports this aircraft seems excellent and a tribute to its builders, but what a waste of effort to put a brand new airworthy aeroplane into a museum. Wouldn't it be better with the Shuttleworth Trust or other flying organisation? If Hendon wants a replica for static display surely they can get one for less than £40,000. The report goes on to say that Viv Bellamy's next project will be a 'Hawker Fury'.

Well just for the record, I have made a full-size 'Fury II' replica for the Cosford Aerospace Museum. Not by a long stretch of the imagination would I guess that the workmanship or finish is in the same class as the 'Strutter', but of course it was made under quite different conditions (outside) and only cost £100 not £40,000.

The replica is, however, quite good enough for static exhibition and has been seen by hundreds of visitors including many senior RAF officers (some of whom accepted it as a real aircraft).

I know there are many schools of thought in the 'fly or not-to-fly' argument about rare and precious aircraft, real or replica. But if an aircraft is never intended to fly and is known to be for exhibition only, why spend valuable skill and materials in making it airworthy? Once the covering is on who knows (or cares) if the

Below: Photograph taken by reader Ted Richards of his full-size 'Fury II' replica, showing the construction of the aircraft in his back garden.



main spar is 'genuine Hawker dumb-bell' shape or a piece of 3x1 timber. Standards of perfection are very praiseworthy if you have the time and money to maintain them.

TED RICHARDS

Tipton,
West Midlands

Camera arrest

Sir,

Like many of your readers I am a keen aviation photographer, who will go to any reasonable lengths to photograph a particular aircraft.

Recently I was arrested for taking photographs of Wasp helicopters at Portland. It appears that you are not allowed to stand on a public beach, point your camera away from the base and photograph helicopters on approach. There are no notices to this effect, so until the police arrived I did not know that I was, as they put it, committing an offence under the Official Secrets Act.

I would be interested to hear from any readers who have had similar experiences whether at Portland or at other bases.

P. J. BRYANT

39 Gainsborough Close
Salisbury
Wilts

Short flight

Sir,

On 26 March I took a US flight on Republic Airlines (Flight No 188) from Duluth to Minneapolis with a stop at Hibbing, all within the State of Minnesota. The schedule shows the time between Duluth and Hibbing to be 17min — I timed it at 16min from push-back from the gate at Duluth to stop at the gate at Hibbing. The aircraft was a DC-9 srs 50 and the pilot announced that flying time was about 10min.

Could this be some sort of record for a scheduled short flight by a first level airline using full size jet equipment? Perhaps your readers could come up with a shorter one.

W. T. SHULL

Lansdowne, Pa USA



Peter R. March

Paralyser Project

Back in the 1950s plans were drawn up by the Handley Page company to build a full size flying replica of the HP 0/400 'Bloody Paralyser'. With the subsequent problems that the company faced and its eventual collapse the idea disappeared from view. However, it turns out that the project is by no means dead and now that the Handley Page Association has secured the safe keeping of the company's drawings, including those for the 0/400, a group has been set up to look into the problems that such a huge task presents.

The group, recently constituted under the formal name 'The Paralyser Group', is a small band of HP enthusiasts who are at present self-financing the project. They are eagerly seeking support from more members, both to help with the cost and also to tackle the vast amount of work necessary. Obviously a small group is limited in what it can achieve so current objectives are modest, being aimed at producing a front fuselage. It is hoped that this will be of such a high standard when completed that the group will be able to attract sponsorship for the construction of the remainder of the aircraft, and that the difficult problems of powerplants and propellers as well as smaller components and instruments can be resolved.

The 0/400 was a very significant aircraft in its time both to the Company and to aviation in general. It was the first large aircraft to be made by HP and the first to be produced by them in large numbers; it played a leading role as a WW1 bomber in the Royal Naval Air Service and then in

the Independent Air Force; it went on to be used as a communications aircraft at the end of the war and then as a civil airliner — with Handley Page Transport Ltd. It became famous on the cross Channel routes to France and Belgium. Despite this fame and although it is believed that over four hundred were built (including some in the USA) the only remains are a few pieces such as the single outer wing which is on display at the RAF Museum.

Any readers who are interested in joining 'The Paralyser Group' and can contribute to the project, and in the words of the Secretary of the Handley Page Association 'have sufficient enthusiasm to keep going over what will be many years' hard work', should contact the Secretary of the Group, Graeme Curtis, Kingsmead, Dereham Road, Westfield, Dereham, Norfolk NR19 1QF.

Strathallan sale

The well publicised sale of the Strathallan Collection in July netted £645,270 for Sir William Roberts. Auctioned by Christies, with the well known aircraft collector the Hon Patrick Lindsay wielding the hammer, the 26 items had been disposed of within 2½ hr, all but one remaining in the UK. Although the sale had been well supported by overseas buyers only Mosquito B35, RS712/G-ASKB, is destined to leave Scotland, having been purchased by Kermit Weeks of Florida for £100,000. Hurricane IIB, P3308/G-AWLW, will not be leaving Strathallan as it was purchased as an investment by a Roberts family trust for £260,000, so undoubtedly one of the most valuable airworthy machines has been preserved in Britain for the time being.

Above: One of the aircraft sold during the auction of the Strathallan Collection was Monarch, G-AFLW, which had arrived at Biggin Hill by early-August.

Photo: Peter R. March

Prior to the sale a number of aircraft were withdrawn or were not included in the catalogue. Among these were the Lancaster X G-BCOH, Firefly 6 WD833, Battle I R3950, Swordfish W5856, Lysander P9441/G-AZWT and Swallow 2 G-ADPS, all of which will be brought up to flying condition. Two static exhibits were also not included, Comet C2 XK655 and Shackleton T4 VP293 will remain as part of the nine aircraft collection at Auchterarder. The accompanying list details the outcome of the auction as officially reported.

Avro 19	G-AHKX	Private purchaser
Lancaster X	G-BCOH	Retained
Shackleton T4	VP293	Retained
BA Swallow 2	G-ADPS	Retained
Bolingbroke	9940	Royal Scottish Museum
Puss Moth	G-ABDW	Royal Scottish Museum
Tiger Moth	G-AOEL	Private Purchaser
Dragon	VH-SNB	Royal Scottish Museum
Leopard Moth	G-AIYS	Pace Petroleum
Hornet Moth	G-ADMT	Scottish Aircraft Collection Trust
Dragon Rapide	G-AXLT	Science Museum
Moth Minor	G-AFPN	Private Purchaser
Mosquito B35	RS712	Kermit Weeks
Comet 2	XK655	Retained
Battle I	R3950	Retained
Swordfish	W5856	Retained
Firefly AS6	WD833	Retained
GAL Cygnet 2	G-AGBN	Royal Scottish Museum
TBM-3W	G-ATBM	Douglas Arnold
Avenger		
Hurricane IIB	P3308/G-AWLW	Retained through Davies Trust
Hudson IV	A16-199	RAF Museum
Monarch	G-AFLW	Privately purchased
Miles M.18/2	G-AHKY	Scottish Aircraft Collection Trust
Messenger 2A	G-AJOC	Privately purchased

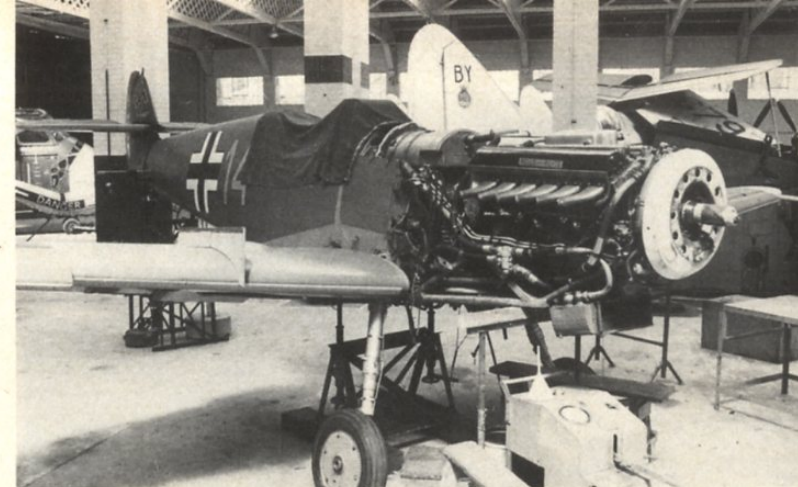
Harvard IIB	FT391/G-AZBN	Colt Aviation
Prentice T1	VS356/G-AOLU	Privately purchased
Short Scion	G-ACUX/VH-UUP	Ulster Folk and Transport Museum
RS4 Desford	VZ728/G-AGOS	Scottish Aircraft Collection Trust
Lysander III	P9441/G-AZWT	Retained

After the sale Sir William Roberts announced that the reduced collection would continue to be shown to the public and small 'family' type air displays would be held at Strathallan on a fairly regular basis.

Preservation view

It was good to see John Fairey's beautiful Flycatcher replica, S1287/G-BEYB, back in the air again at the end of July. It was quite badly damaged last October and many hours have been put into rebuilding it. Now showing no signs of this occurrence it appeared at the Middle Wallop Families Day on 31 July, Yeovilton on 1 August and the Shuttleworth Military Day at Old Warden on 26 July. At the latter event Anson 19, WD413/G-BFIR, was displayed for the first time at this venue, another restoration following a landing accident several years ago. Shuttleworth had the Afghan Hind, BAPC-78/K5457, on static display, showing that it is now substantially complete. Engine runs and taxi-trials are anticipated to be taking place shortly and the aircraft is expected to be airborne before the end of the current season. Work on the Comet, G-ACSS, is moving forward slowly, but it is reported that problems have been encountered with glue joints in the forward fuselage which might set the project back.

Below: Restoration complete — the unique Royal Aircraft Factory RE8, F3556, in the IWM collection at Duxford in August. *Photo: Andrew March*



Above: Rebuilding of the Fighter Wing Display Team's '109' (Hispano HA-1112M, N41857) nearing completion at Duxford.

Photo: Andrew March

A new arrival at Blackbushe for the Arnold Collection is the retired Dan Air Comet, G-BDIT, which was formerly the RAF's XR395. It has been parked adjacent to the old terminal building and is an impressive addition to the apron scene. The dispersed CASA 352s, Dakotas and Mitchells remain little altered during the last year or so, but activity at the hangar end has produced the Mustang ready for flight newly painted in an RAF colour scheme. Work on the Spitfire collection is proceeding slowly with the first aircraft still a year or so away from completion. A new arrival at the end of May in the hangars was Hugh Smallwood's Fokker S-11 Instructor G-BIYU. This former Dutch Air Force trainer, constructor's number 6206 ex-PH-HOM and E-15, is being restored to flying condition and should soon be airborne. Also new on the Blackbushe scene are a pair of ex-Swiss Air Force Pilatus P2s and imminent is the Avenger G-BTBM purchased at the Strathallan auction.

At Duxford the Boeing B-29A Superfortress, 44-61748, is now fully painted and carries the nose art *Hawg*

Wild after the wild pig of Arkansas — the State from which some of her original crew came when the aircraft was first operational with the USAF in 1945. Work is proceeding on quite a number of machines, including the complete restoration of the Imperial War Museum's Royal Aircraft Factory BE2C 2699 and RE8 F3556. The Fighter Wing Display Team's Hispano HA1112M, N41857, is now substantially complete and hopefully will be in the air before the end of the season. Further off is the Bolingbroke IV which is making slow but steady progress. The sole surviving Hermes 4 fuselage G-ALDG, which had been in use as a cabin trainer at Gatwick, is stored outside of the workshop hangar — the latter being fully occupied with the Sunderland, B-17, Mitchell, Hastings, Spitfire and others. Duxford is also providing a base for a former Swiss Air Force Pilatus P2, appropriately registered G-PTWO.

A new arrival at Biggin Hill is Miles Monarch G-AFLW which Neil Jensen, owner of Proctor G-AIWA/R7524, purchased at the Strathallan auction. Also at Biggin, Harvard G-ELLY has been painted in period USAF markings with the code TA-867 and its original serial 41-33867; it has appeared as such at several recent air shows including Hurn, Yeovilton and Fair Oaks. A further addition to the restorations from the Mann hangar will be Messenger G-AKVZ, which was quite well advanced in mid-August. This last remaining Messenger 4B has lain in a dismantled state for nearly ten years.

At Kemble late in July the rebuilt Battle of Britain Flight's Spitfire AB910 was complete and painted ready to fly, while down at Yeovilton the RN Historic Flight's Harvard EZ407 is still in part-completed state although continuing to



Above: The rather weathered-looking TB-25N Mitchell 151863 Big Bad Bonney, retracting its undercarriage after take-off from RNAS Yeovilton during the International Air Day on 1 August. Photo: Tim Laming

receive attention. TB-25N Mitchell, 151863, turned up at this Naval base for the International Air Day on 1 August, having flown in from the continent. This is the long term resident of Dublin Airport which has spent several weeks in France. It looks very much the worse for wear for its battering by the elements and is clearly in need of a good deal of attention. Although programmed to fly at Yeovilton it took off early in the programme and departed from the area. It was reported a few days later to have taken up temporary residence at Coventry, where it was being worked on.

As usual during the summer months a number of preserved aircraft and other exhibits are moved between collections. The HAPS at Cleethorpes has set up the newly named Bomber County Aviation Museum. Initial items include the Stewart Ornithopter BAPC61, Flea BAPC76/G-AFFI and Vampire T11 XD375, the latter moving from Elsham. At Sunderland, in addition to the remains of Swift WK198 and Brigand RH746, a significant proportion of Firefly AS5 VT409 has been acquired from the closed scrap yard in Manchester. Auster AOP9, XP283/7859M, has arrived at Shoreham from Middle Wallop as part of the swap for EP9 Prospector, G-ARDG, which is now with the Museum of Army Flying. The Cotswold Aircraft Restoration Group has obtained Meteor T7, VW453, from the Defence Establishment at Porton Down and is to have it transported to RAF Innsworth, Glos where it will be prepared for static display and eventually appear at the station's gate alongside Javelin FAW9/XH903. Two further Javelins are to be preserved, Mk 5 XA699 and Mk 8 XH992, both formerly used by 2 School of

efforts to reach Waddington he crash landed some distance short of the airfield. The aircraft turned over and trapped the pilot who was burned in the ensuing fire as he made his escape. The loss of G-FURY/WJ244, one of the few remaining Sea Fury single seaters, is part of the price we have to pay for seeing so many interesting vintage and veteran aircraft in the air over the UK.

airevents'81

The 1981 PFA International Rally held at Leicester on 3-5 July was another success for the light aviation and homebuilt movement in the UK. Despite the difficulties of weather in some parts of the country and strong cross-winds at Leicester, over 630 different aircraft attended during the weekend. Perhaps there were not quite as many new homebuilt machines on show but quality certainly made up for quantity and such turnouts as four Proctors and 18 Austers on the field at one time were very good to see. A great deal of effort now seems to be going into the restoration of vintage light aircraft and there is a resurgence in the construction of accurate replicas. Mike Beach showed his recently completed Bleriot Type XI replica G-LOTI alongside his SE5A replica and announced that he plans to start work on a new World War I project as soon as a suitable powerplant can be found for it.

Winner of the Airtour Sword for the Best Replica went to Don Cashmore for his Sopwith Tabloid Scout G-BFDE (see colour photo on page 237 of *Aircraft Illustrated*, May 1981). This replica flown last year for the first time is painted to

Below: Best homebuilt at the 1981 PFA International Rally held at Leicester was John Kimber's EAA Acro Sport, G-BJHK. Photo: Peter R. March



AIRCRAFT ILLUSTRATED

Right: One of the first airshow appearances by Sopwith Triplane, N5430, was at Badminton Air Day on 19 July. Photo: Graham Finch



represent aircraft No 168 of the Naval Wing at Eastchurch. The Bleriot, which has yet to fly, was highly commended. Two part completed Sopwith Pup replicas (G-BIAT and 'IAU) were present and the flying display included Fw190 scale replica G-WULF and three Isaacs Furies, G-ASCM/K2050, G-AYJY and G-BEER. Among the recently restored genuine aircraft present were Swallow G-AFGE from Sandown, Adam RA-14 G-BHIK, Stearman G-ROAN in an eye-catching all black colour scheme, and winner of the cup for the best vintage aircraft — Cliff Lovell's DH60M Moth G-AAMY. Another Lovell restoration, the DH Dragonfly G-AEDU, which had flown only a few days before, was prevented from landing by the strong cross winds on the Sunday but certainly looked well up to the high standards we now expect from the Walkeridge Farm workshops.

John Kimber's EAA Acro Sport G-BJHK was judged the best home-built aircraft at the rally and there was no one who would disagree with that. Runners up were the Christen Eagle G-EGLE, Pitts SID G-BETI, and Minicab G-BGMR. The PFA prize for the best original design went to Dr R. Kendal for his unusual Mayfly. Although brought in by road it had made its maiden flight a few days before the rally. With an all up weight of only 750lb the Mayfly's performance from its 1,600cc VW engine looks to be very good. Other awards went to the Christen Eagle (*concours d'elegance*), Bensen G-YROS (best gyrocopter), and Tiger Moth DE992 (best Tiger). Unfortunately the event was not without incident, largely brought about by the strong southerly wind; Jodel D9 Bebe G-AZBL was blown off the runway and turned over attempting the overshoot, and the recently restored Stampe G-BHFG in French Navy colours as '45' was also quite seriously damaged.

A week later the Air Britain International Fly-in at Old Warden produced 118 visitors, a record for the event. In addition to the fly-in and air display there was a Diamond Jubilee Commemorative Varsity Air Race in which three Bulldogs from each of the Oxford and Cambridge University Air Squadrons flew a course in celebration of the first such race held at Hendon on 16 July 1921. The winning team this year, with the highest aggregate time, was Cambridge UAS, repeating their success of 60 years ago. A novel and very successful feature of the day's activity was the opportunity for pleasure flights in eight veteran aircraft, including Puss Moth G-AEOA, Fox Moth G-ACEJ, DH60G

Moth G-ATBL, Harvard G-JUDI/FX301 and Dragonfly G-AEDU.

The gamble of reducing the Bourne-mouth Air Pageant from two days to one paid off according to organiser Janet Hoare; 'We had more than last year's two day attendance on the one day and a much better show, I expect we will do the same again next year'. Of all the family air shows along the south coast in the summer months the Hurn event certainly provides interest and variety. British Aerospace gave a rare glimpse of one of its Strike-masters G-BIDB in the flying programme and had the ICA-Brasov IS-28M2, G-BROM, alongside a One-Eleven in the static display. Local residents, Flight Refuelling Ltd and Airwork Services, also had goodies on show. The third conversion Sea Vixen D3 XS587 showed yet another multi-coloured paint scheme, while trials Canberra TT18 WK143 had additional probes. Sultan of Oman Air Force Skyvan No 906 was awaiting delivery after a major overhaul at Hurn. A novel feature of the aerobatic flying from the inevitable Pitts was to introduce a competition with a prize from the local newspaper. This brought in other types, in particular Eric Muller the Swiss champion flying the prototype CAP21 F-WZCH and winning the competition by a clear margin.

Also taking place on 19 July the Badminton Air Day at the famous equestrian estate was another example of a good family show in ideal surroundings. John Davies had to work hard to secure a good mix of vintage, veteran and modern aircraft. Ingenuity was used for example to bring the Battle of Britain Flight through in a flypast as they transited the Lyneham Control Zone from Hurn to Brize Norton. As previously this event was well supported by Personal Plane Services from Booker and included a rare public display by the Sopwith Triplane N5430, which was shown by Tony Bianchi to be fully aerobatic. The military air shows around the 18-19 July did, however, leave a great more to be desired. The NATO Open Day

at Upper Heyford attracted a large crowd but had a meagre static display, with nothing larger than a Phantom included, and a flying programme that lasted four hours, but with gaps of up to 20 minutes between items. The Navy shows were not like this, however, including a better variety but not a great deal of support from other air arms. The appearance of French Navy Alize No 30 of 4F at Lee-on-Solent was interesting.

Old Warden's big event of the year, the Military Flying Day on 26 July attracted a huge crowd to this tiny Bedfordshire airfield. The weather was reasonable and a well planned programme presented Shuttleworth's unique military aircraft alongside participation from all three services. New items for Old Warden included John Fairey's rebuilt Flycatcher, Anson C21 WD413/G-BFIR, Tabloid Replica No 168/G-BFDE and Prentice VS610/G-AOKL all in the air. Visitors included the new Robinson R22 G-BISC and Stinson Voyager OY-AVE.

The International Air Day at RNAS Yeovilton on 1 August was well up to the high standard now expected of this annual event. Threatening weather on the arrivals day gave way to warm sunny weather for the display. The large static park included several public firsts, including Norwegian Lynx, 216, and RAF Chinook HC1 ZA676, coded FJ. The latter helicopter also appeared at the Army Families Day at Middle Wallop on 31 July alongside a new eight-Gazelle helicopter display team, more of which will be seen next year. Returning to Yeovilton, the flying display included a novel feature, which used to be a regular part of shows in the 1960s — formations of representative based aircraft. Visitors were treated to a Sea Harrier, Hunter and Canberra T22; a Sea Devon, Sea Heron and Jetstream; and Gazelle, Wessex 3, Wessex 5, Sea King HAS2, Sea King HC4 and Lynx HAS2 in their respective fixed-wing and helicopter formations. Overseas participation came from the French Navy with a Super Etendard



Top: Lynx 216 of the RNoAF made its debut at Yeovilton's Air Day; note the rescue winch over the doorway.
Photo: Peter R. March

Above: No 899 Squadron Sea Harrier joins FRADU Canberra T22, WT510 and Hunter GA11, XF368, for a rare formation at Yeovilton on 1 August.
Photo: Andrew March

and the Belgian Air Force with an Alpha Jet. It was most unusual to see a Dakota in the shape of G-AGHY, two Danish Super Sabres, both two-seat TF-100Fs (GT-908 and GT-949), a French Navy Paris (No 40) and an Alize (No 12). Noticeable by their absence were the Sea Harriers of the Navy's third squadron, No 801 Squadron, which was aboard HMS *Invincible*. There was no hint of gloom at Yeovilton despite the vicious cut which will undoubtedly take their toll of the Fleet Air Arm over the coming years.

Of course during the peak months of the year there are many more shows, large and small, up and down the country which all have their particular items of interest. The Fairoaks Show on 2 August included the NDN-1 Firecracker, G-NDNI, skilfully flown by Peter Phillips, while Humberside on the same day featured Spencer Flack's trio of scarlet fighters. Popham's Auster Fly-in on 9 August was marred by unfavourable weather; low cloud over most of southern England kept most visitors away, except Rupert Hibbert's

Aiglet Tr G-BGKZ. Super Cub G-BIRH arrived from Lee-on-Solent sporting Dutch Air Force colours and serial R-163. It heralds a large influx of these Piper lightweights as Cliff Lovell has recently brought in no less than eleven ex-Italian Air Force Super Cubs.

The last weeks of the 1981 air show season fall into the customary pattern with events at Old Warden and Duxford and the last of the RAF 'At Homes'. The new Midlands flying centre at Wellesbourne Mountford is having a fly-in, rally and competition weekend on 26-27 September, to show that it is now firmly established. The Confederate Air Force Eagle Squadron and the PFA Midlands Strut have recently set up their headquarters at the airfield.

September

- 17 Jersey, CI — Battle of Britain Display
- 17 Guernsey, CI — Battle of Britain Display
- 18-20 Longleat House, Wilts — International Balloon Meet
- 19 Leuchars, Fife — RAF Battle of Britain At Home Display



- 18-19 Finningley, S Yorks — Aerobatic Competition
- 19 Finningley, S Yorks — RAF Battle of Britain At Home Display
- 20 East Fortune, Lothian — Museum of Flight Open Day
- 26-27 Camphill, Derby — Vintage Glider Club Autumn Rally
- 26-27 Wellesbourne Mountford, Warks — Rally and Fly-in weekend
- 26 Thorpe Park, Surrey — Leisure Sport Flying Day
- 27 Old Warden, Beds — Shuttleworth Flying Pageant
- 28-3 October Kilkenny Castle, Eire — Hot Air Balloon Championships

October

- 2-4 Guernsey, CI — 10th Annual Rally and Race
- 4 Shotteswell, Oxon — Vintage Aircraft Club Spot Landing Competition
- 11 Popham, Hants — Vintage Aircraft Fly-in
- 11 Duxford, Cambs — Local Flying Day
- 11 East Fortune, Lothian — Museum of Flight Open Day
- 25 Old Warden, Beds — Shuttleworth End of Season Flying Day

Readers are again reminded that some of the above dates are provisional and anyone intending to make a visit to one of the events should first confirm with the organisers that it is taking place on the date and at the place shown.

Note: The Imperial War Museum Collection at Duxford closes to the public for the winter from 1 November: it will re-open for the 1982 season in mid-March. The Shuttleworth Collection at Old Warden remains open daily throughout the winter, except for a week at Christmas.

For some of this month's contributions we would like to thank: R. Bonser, D. Conway, G. Finch, J. Guthrie, A. March, R. J. Rudhall, K. A. Saunders, E. A. Shackleton, A. J. Wright and R. Wright. Also the publications *Air Scotland*, *Air Strip*, *Aviation Ireland*, *British Aviation Review*, *Cotswold Messenger*, *Flypast*, *Handley Page Newsletter*, *Humberside Air Review*, *Irish Air Letter*, *Prestwick Airport Letter*, *Scottish Air News*, *Skyward*, *South West Aviation News* and *Vintage Aircraft*.

Below: A number of Northrop F-5s for the Royal Moroccan AF made a refuelling stop at Prestwick airport in August during their delivery flight from the US to Morocco — F-5E, 79-1937 is seen here. Photo: J. Guthrie

airkits

James Goulding

New General Aviation kits

Revell has released three kits in 1:48 scale of well-known general aviation light aircraft. Although one hesitates to use the term 'new kits' because these models have been marketed before under another label, they will nevertheless be new to many modellers — and in any case they are extremely good and welcome additions to one's collection.

One of the models is the Cessna 150 high-wing cabin monoplane, a typical aircraft of this popular Cessna range. The 150 is one of the lower-powered Cessna types, with a four-cylinder 100hp Continental engine, and is basically a two-seater, with a less comfortable rear bench seat. The 150 is used throughout the World in flying clubs and as an economical private owner's aircraft.

The Revell kit is an excellent one; it is well-moulded, the fit of parts is accurate and the general shape is good. A feature of all three models is the well-detailed engine installation. In the Cessna 150 the horizontally-opposed inline powerplant, the tubular engine mounting and exhaust system all look very convincing — and a detachable engine cowling permits the installation to be viewed.

The cabin is well-appointed, with good seats and an excellent instrument panel, into which the control columns are cemented. Surface engraving on all components is very good. Markings are included for either a Cessna 150 or a Cessna A150L Aerobat.

The second model in this series is a delightful replica of the Piper Super Cub PA-18, another of the famous series of high-wing cabin monoplanes. The Super Cub is a two-seater — arranged in tandem. The engine installation is similar to that of the Cessna 150, the powerplant being another four-cylinder type — the 150hp Lycoming.

The Super Cub is a fabric-covered aircraft and this aspect of the model is excellent — with the tautness of the fabric on the wing's having just about the right amount of sag. The cabin is quite simple in the Super Cub and with its extensive window area additional detail, such as straps, could well be used to improve the interior. However, all the struts and tubular framing visible inside the cabin are delicately moulded.

Decals are provided for the standard Super Cub red trim, with numerals (1-10) and a number of registration letters in black.

The third kit in Revell's series is the

most complicated and is the Beech Bonanza V-35A low-wing monoplane, with Vee-tail. The Bonanza is a six-seat aircraft and the cabin on the model has been well-portrayed, with good seats and instrument panel. It is pleasing to see how much attention has been paid to the shape of the wing, which is always one of the most critical areas of any model. The thick aerofoil section of the Bonanza has been convincingly reproduced, with knife-edge trailing edges. The unusual tip design is well shown. Some of the parts on the runner are so delicate that care must be taken not to snap them. This particularly applies to the exhaust parts, undercarriage units and ailerons.

The decal sheet gives numerals and letters in black, and the Beechcraft Bonanza logo.

These three fine kits cost £1.99 each.

A photo-Phantom

An Italeri kit which has been sent for review is a 1:48 scale McDonnell Douglas RF-4C/E. There are a number of 1:48 scale Phantom kits available, but most of these are fighter/ground attack variants; therefore the issue of a kit of a specialised photo-recce version is a welcome change.

The forward fuselages of the RF-4C or E, have very different contours compared to the fighter type. The photographic nose has local flat areas for camera windows — so as to avoid distortions and reflections — and there are six such windows for various camera angles. The front fuselage terminates in a pointed radome.

This is another very good 1:48 scale Phantom kit, with particularly well detailed cockpit. The ejector seats look very authentic and on the fuselage walls there are many components. The consoles have raised detail, such as dials and knobs, and decals are provided for the instrument panels. A nice touch is that the backs of the instruments can be seen on the rear of the panel.

Externally, the engraving lines are raised and in this respect the kit does not reach the heights of excellence of the superb series of ESCI F-4 kits. There are good representations of the undercarriage legs, wheels and doors, with good detail on the inside faces of the latter. Two sets of jet

pipes are included, one for each variant, and a separate burner unit component is cemented into the rear of whichever jet pipe is selected.

The four wing pylons are included in the kit but only the outer pylons have stores installed, which are long-range tanks. A third tank is fitted under the fuselage. Two excellent decal sheets are in the kit, one with the main markings, and the second with stencil and line markings. Two RF-4 subjects are featured; one is an RF-4E of the *Luftwaffe*, the aircraft belonging to *AKG 52*. The second is an RF-4C from the 363rd Tactical Reconnaissance Wing, USAF.

The cost of the Italeri RF-4C/E is £3.54.

Italeri Fighting Falcon

As far as plastic construction kits are concerned the General Dynamics F-16 Fighting Falcon is a lucky aircraft. Not only are there a large number of kits available — by a host of different manufacturers and in a wide range of scales — but almost all the kits are very good. On the other hand the MiG-21, in service with some 20 airforces and a very important modelling subject, has been produced in only two accurate kits (both by Revell) and a few more very indifferent offerings.

The latest F-16 kit to reach us is in 1:72 scale and is by Italeri (once known as Italaerei). Like the Matchbox version this kit gives parts for either the single-seat F-16A or two-seat F-16B. This model is one of the best 1:72 scale kits of this interesting and pleasing little fighter so far available, particularly so in its two-seat form. To date this is only the second F-16B kit available in this scale and the most detailed. The upper section of the forward fuselage has a cut-out, in which either the 'A' variant or 'B' model cockpit opening and canopy can be used as desired. Cockpit detail for both variants is satisfactory, with good ejector seats, side

Below: Beechcraft Bonanza V35A, N6552V, passing over the threshold just prior to touchdown. The type is the subject of a new 1:48 scale model in Revell's new General Aviation series.
Photo: Beechcraft



consoles and instrument panels (for which decals are provided). The canopies for both versions are large and clear, and make increased detailing worth the extra effort.

As with most of the available F-16 models, the surface engraving is excellent, consisting of indented skin and panel lines. The appearance of the outlet blister for the rotary cannon can be improved by drilling out the hole. Two forms of afterburner outlet are included in the kit, one fully open, as when the afterburner is in operation, and the other in a closed, 'dry', position; there is a convincing burner ring for use in the inside of either jet pipe.

A comprehensive selection of stores is provided in the kit. Two Sidewinders are mounted on the wing tips and two Sparrows are attached to the outer pylons under the wings. The centre-wing pylons house laser-guided bombs and the wing inner pylons have long-range tanks — another tank is carried on a pylon under the fuselage.

There is good detail on such items as the undercarriage legs and the inner faces of undercarriage doors. A good decal sheet gives markings for a USAF F-16A and an F-16B of the RNethAF.

This is another excellent kit of the F-16, and, doubtless, by no means the last! Italeri's model costs £1.72 and it was kindly supplied for review by JNT Model Products Ltd, who are the UK distributors of Italeri Kits.

New Decal Sheets

Modeldecals Sets 62 and 63 are now available. These are intended primarily for the French market. Set 62 has 133 French roundels in nine sizes together with nine sizes of anchor markings for *Aéronavale* aircraft; the anchor markings are, of course, superimposed on the standard national markings.

Set 63 contains more than 380 letters and numerals. These are in black and in four heights, from 3.3mm to 7.3mm, and are in solid black or in outline form.

These French decal sheets are for use with post-WW2 aircraft. They are available from Modeltoys, 246 Kingston Road, Portsmouth, Hants PO2 7LR. The price per set is £1.10 (including VAT). Postage and packing is 25p for up to two sets and 30p for three or more sets.

Having reviewed the Italeri F-16 kit, it is timely to mention the 1:72 scale Microscale decal sheets 72-276 and 72-277. Sheet 72-276 gives markings for three USAF F-16As and one F-16B. These F-16s are from the 388th Tactical Fighter Wing, three from Hill AFB, Ut and the F-16B from MacDill AFB, Fl. The F-16B featured, 096, is unusual in being painted in the low-level attack colours of Dark Green (FS34092), Medium Green (FS34102) and Dark Grey (FS36081).

Sheet 72-277 gives markings for NATO F-16s. The set includes F-16As, from the Belgian AF, RNethAF, RNorAF, RDAF and one F-16B from the RDAF.

Both of these sheets have a lot of additional items beside the primary national markings and serials, including instrument panels and console panels, walkway lines, ejector seat triangles, stencil panels, etc.

Another excellent Microscale sheet in 1:48 scale, 48-93, gives markings for prototype and early production F-16s. These are for F-16s in the distinctive red, white and blue scheme. This sheet includes the blue decor, fin markings, 'US Air Force' fuselage markings, flags of countries buying the F-16, instrument panels, and warning and rescue panels. US national markings are not included as these would be supplied with the kit.

I am less happy with 72-292, a sheet of Spitfire 'Ace' markings, and 72-294, a similar sheet of Hurricane 'Ace' markings.

On the Spitfire sheet Ian Gleed's IR-G fuselage letters should be in Dark Blue and not red as shown. Beurling's 'KH-B' initials should be in Sky and not blue. Johnny Kent's 'JA-K' should be in Medium Sea Grey, not off white as shown. The roundels on the sheet are satisfactory, but the red used is rather bright.

The instruction sheet has some surprising errors in view of all that has been written on the subject of wartime markings. Prosser Hanks' and Yarra's Spitfires seem to be accurate, although the latter aircraft may have had a Dull Red spinner. Ian Gleed's 'IR-G' had a Dull Red, not Azure Blue, spinner. Beurling's Spitfire had a Sky-painted spinner, not Azure Blue. Although the lead line for Medium Sea Grey (called 'Sea Grey Medium') points to the fuselage side, as well as Ocean Grey, this was obviously intended to point to the under-surfaces. Johnny Kent's Spitfire MkVB is given as being painted in Dark Earth and Middle Stone, with Azure Blue under-surfaces, whereas it should be painted in Dark Green and Dark Earth, with Sky under-surfaces. The spinner was Sky, not Azure Blue.

The plan view camouflage drawing is correct for a desert-operating aircraft in Dark Earth/Middle Stone/Azure Blue, but the dark and lighter areas should be reversed for a Spitfire in Dark Green/Dark Earth (or Ocean Grey) finish on the upper-surfaces.

The Hurricane sheet is also full of errors. Unfortunately the pilots of the five Hurricanes featured are not mentioned!

The first aircraft is from No 501 Squadron and is in Dark Green/Dark Earth/Sky finish, but the code and aircraft letters should be in Medium Sea Grey, not off white. W9145/DX-L was also used during the Battle of Britain in the usual Dark Green/Dark Earth upper-surface

Right: Two USAF F-16s of the 4th TFS, 388th TFW staged through RAF Alconbury in March. This F-16A, 78-0075, produced an interesting water-spout effect as a film of water lying on the taxiway was sucked up into the engine air intake. Note the cockpit arrangement of the F-16A compared to that of...

Below right: ... the two-seat F-16B. This aircraft, 79-0411, also from the 388th TFW at Hill AFB, Ut is carrying long-range fuel tanks. The F-16A and F-16B are the subjects of a new 1:72 scale kit from Italeri and also a set of Microscale decal sheets, 72-276.

Photos: David and Ian Hawkins

colours and the under-surface colour should be Sky and not Medium Sea Grey, as mentioned in the instruction leaflet. The code letters should be Medium Sea Grey, not off-white. The third Hurricane is a mystery; as the under-surfaces are quoted as black and white, the upper-surface must be in the Dark Green and Dark Earth scheme. The fuselage roundel is the Type A, which went out of general use after May 1940 and the standard fin flash (27in×24in), which came into use after August 1940, are shown together. The single letter 'P' is again off-white.

The No 17 Squadron Hurricane is 'YB-J' N2359. The fuselage roundels were standard 35in Type A with an additional yellow ring painted on after May 1940 — but those on the sheet are Type A1 in only 35in overall. The size of the modified roundel would be 49in with part of the yellow ring cut off by the under-surface colour. 'YB-J' also had the entire forward part of the fin in Dull Red. Again the code letters should be Medium Sea Grey and not off-white. The spinner of this aircraft is a light shade in photographs, probably yellow. Sky is another possibility, although officially the standard Sky spinner did not come into general use until after the issue of a directive to Fighter Command on 27 November 1940. The 18in rear fuselage Sky band came into use on the same Order. It may be, however, that some aircraft were selected to try out the Sky spinner recognition feature before it was generally adopted.

The fifth Hurricane is an all-Special Night aircraft of No 1 Squadron used in the night fighter role. As this aircraft had Type C1 roundels the red code letters are correct. The red used in these decals is rather bright.

Microscale decals are of very high quality and it is a pity that these inaccuracies on British aircraft should have occurred. The company should consult authorities on British markings to check accuracy before producing the decals.

These sheets cost £1.82 each.

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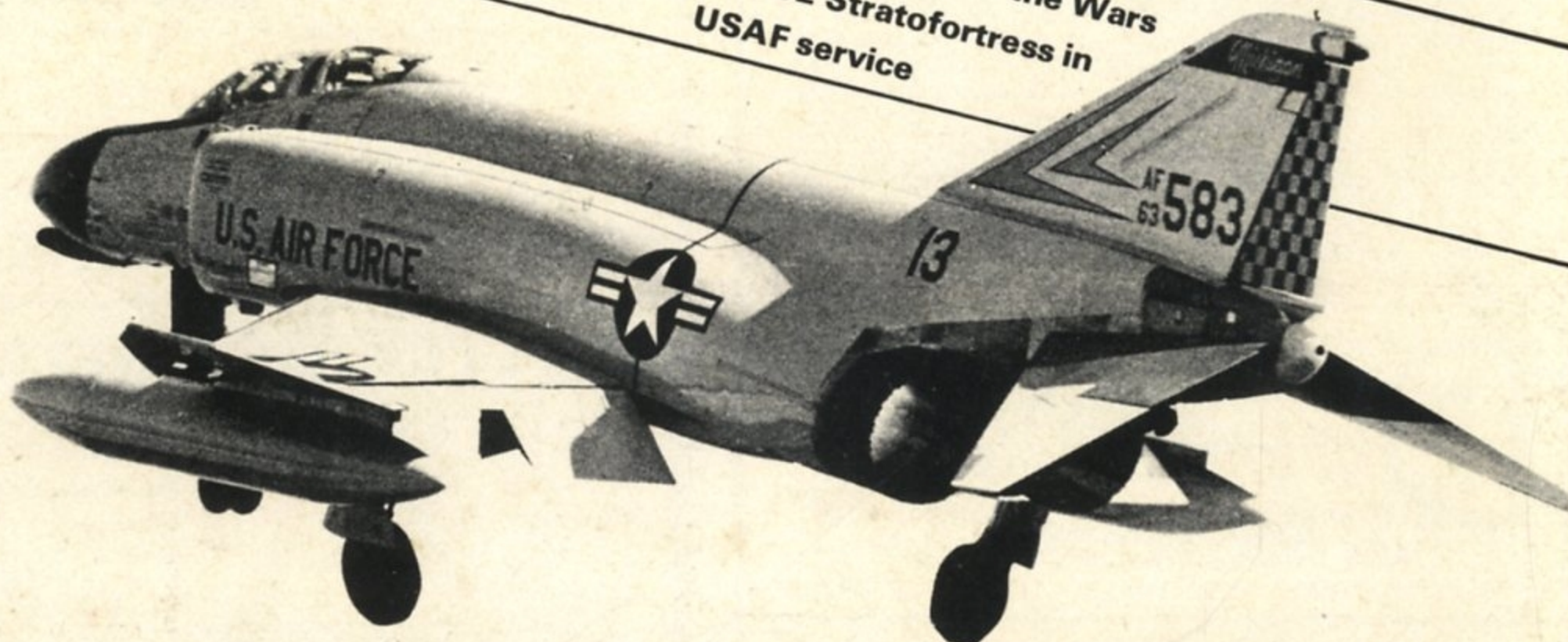
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